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FM 5-20A

WAR DEPARTMENT FIELD MANUAL

CORPS OF ENGINEERS

CAMOUFLAGE OF INDIVIDUALS AND INFANTRY WEAPONS

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WAR DEPARTMENT • FEBRUARY 1944

MANUALS IN THE FM 5-20 SERIES

FM 5-20	Camouflage, Basic Principles
FM 5-20 A	Camouflage of Individuals and Infantry Weapons
FM 5-20 B	Camouflage of Vehicles
FM 5-20 C	Camouflage of Bivouacs, Command Posts, Supply Points, and Medical Installations
FM 5-20 D	Camouflage of Field Artillery
FM 5-20 E	Camouflage of Aircraft on the Ground and Airdromes
FM 5-20 F	Camouflage of Antiaircraft Artillery
FM 5-20 G	Camouflage of Rear Areas and Fixed Fortifications
FM 5-20 H	Camouflage Materials and Manufacturing Techniques

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WAR DEPARTMENT,
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G. C. MARSHALL,
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OFFICIAL:

J. A. ULIO,
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CHECK LIST

1. INDIVIDUAL (watch form, shadow, texture, color).
   a. Prepare individual equipment in the following order:
      (1) Helmet (break form, color, shine; keep garnishing short).
      (2) Face and hands (darken, disrupt).
      (3) Weapons (disrupt).
      (4) Shine (darken, conceal, remove).
      (5) Canvas equipment (darken).
      (6) Camouflage clothes, body nets (where necessary; especially patrols, observers, covering parties).
   b. Choose position carefully for:
      (1) Fire mission (field of fire, observation, communications).
      (2) Other factors (concealment, cover, obstacles).
   c. Consider enemy viewpoint (ground and air; enemy is alert).
   d. Use natural concealment (terrain features, darkness, mist, shadow).
   e. Blend with background.
      (1) Silhouette (avoid becoming one).
      (2) Shadows (use them, do not make them).
   f. Avoid careless movement.
      (1) Move by bounds between good concealed fire positions.
      (2) Move swiftly or crawl very slowly (when forced to).
      (3) Select time and place of movement that enemy will least notice.
      (4) Use concealed routes, buildings of all kinds, burned-out places, gorges, defiles, cliffs, embankments, caves, hollows, ditches, hedges, edges of woods with undergrowth, fence lines, terrain irregularities which contain usable shadows. Keep off roads and paths.
      (5) Avoid landmarks, lone trees and rocks, fence corners, light ground, edges of woods with no undergrowth, all targets in silhouette.
   g. Camouflage discipline.
      (1) Maintain camouflage.
      (2) Carelessness may reveal the team (move quietly, watch banging equipment).
      (3) Don't look up at planes.
      (4) Don't walk or drive in open; make no unnecessary tracks.
      (5) Disperse on march and in bivouac.
      (6) At halts during a march, disperse and take cover.
      (7) Don't throw newspapers, boxes, ration tins, or cans in the open.
      (8) Don't use open flashlights or matches in a combat area at night.
      (9) In sudden enemy light, stop moving, or drop.

2. FOXHOLES
   a. Choice of position.
   b. Natural concealment.
   c. Background.
   d. Tracks.
   e. Spoil and concealment.
   f. Covers.

3. SHELTER TENTS
   a. Strike or cover front.
   b. Don't pitch in daytime.

4. WEAPONS
   a. Know how flat-top garnishing works.
   b. Know how to blend nets with different backgrounds.
   c. Know how to erect net easily, quickly, properly.

FIGURE 1.

FIGURE 2.

YOU ARE THE TARGET

Individual camouflage is the *concealment* a soldier uses in combat to surprise, deceive, and outwit the enemy.

The ground is the soldier's observation post, jump-off point for attack, route of advance and communication, fortification, protection, and obstacle. He must know how to use the ground for effective concealment. He adapts his dress for best concealment while in the firing positions and for mobility, and carefully selects his routes between positions for such concealment as is possible while he is in motion. Interruptions, crawling (very slow) and running (very fast), aid concealment of motion.

The simple principles in this book have been battle tested. If the soldier learns and practices them continuously in training, he will know what to do about concealment at the right time in battle.

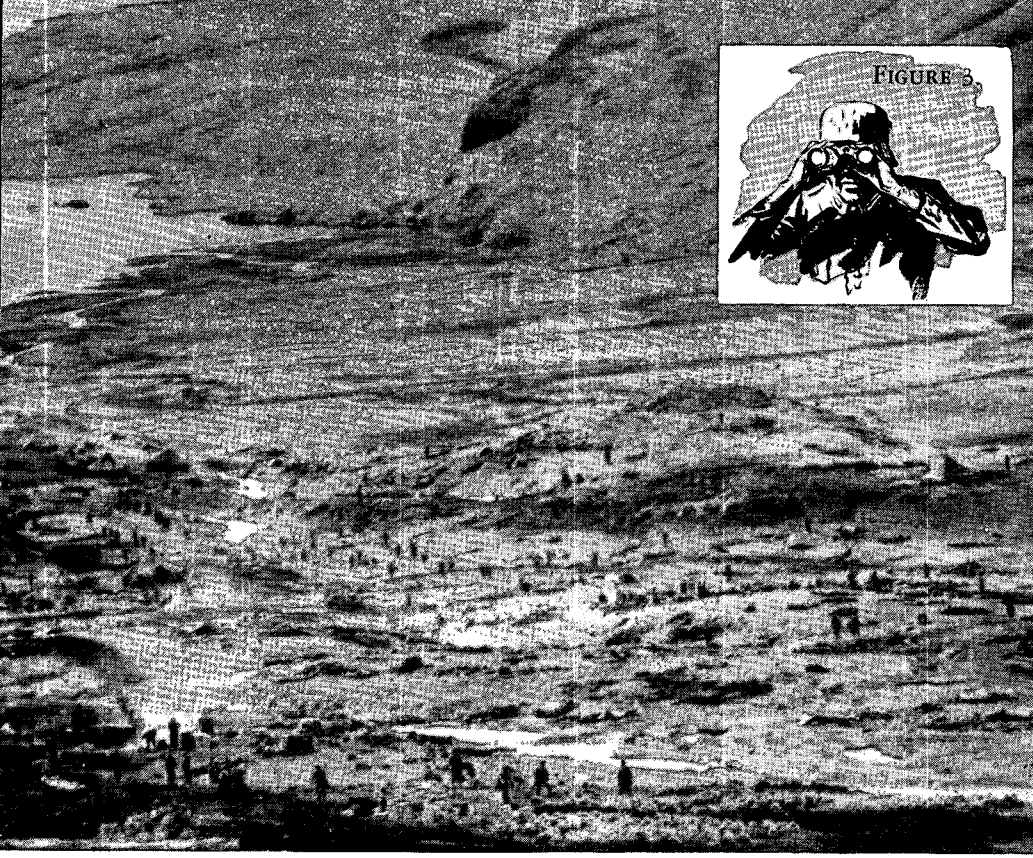


FIGURE 4.

ENEMY OBSERVATION

Camouflage activities of the individual are designed to deceive two kinds of enemy observers—ground and air. The above photograph shows a ground observer's view of a landing operation. We are all familiar with views from the ground, but views from the air are different. Many things that are invisible from the ground can be seen from the air. In modern war, the enemy puts much reliance on aerial photographs for information about our activities and our intentions. The more they reveal to him, the better prepared he will be, and the harder to defeat.

By becoming familiar with the different look of things from the ground and from the air, by study of the ground view, and by studying aerial photographs, you can learn how to guard yourself and your unit against both kinds of observation. Bear in mind, too, that hostile observers both on the ground and in the air may use field glasses, telescopes, and cameras equipped with special lenses to increase their range of vision.

CONCEALMENT DEPENDS ON—

Effective concealment of the individual depends primarily on background—your choice of it, and your knowledge of how to employ it to your advantage.

Background is your surroundings seen from the ground and from the air. They may be anywhere—a portion of a jungle; an area in a barren, rocky desert; a farmyard; or a city street.

Background is the controlling element in individual concealment. It governs every camouflage measure taken by the individual. You wear clothes which blend with the predominant color of the background, and tone down the color of your skin and your equipment for the same purpose. You practice blending with your background by hiding in shadow and by avoiding contrast between your silhouette and the background. You avoid movement which the stillness of the background will emphasize. To keep the appearance of the background free of signs which point to the presence of military personnel, you follow concealed routes; and you conceal spoil, tracks, equipment, and installations.

This book tells how you—the individual soldier—can conceal yourself. In the illustrations, background, movement, signs of activity, and dress are inseparably connected, just as they are on the battlefield. Each soldier must be aware of them every moment of the day.

FIGURE 6.

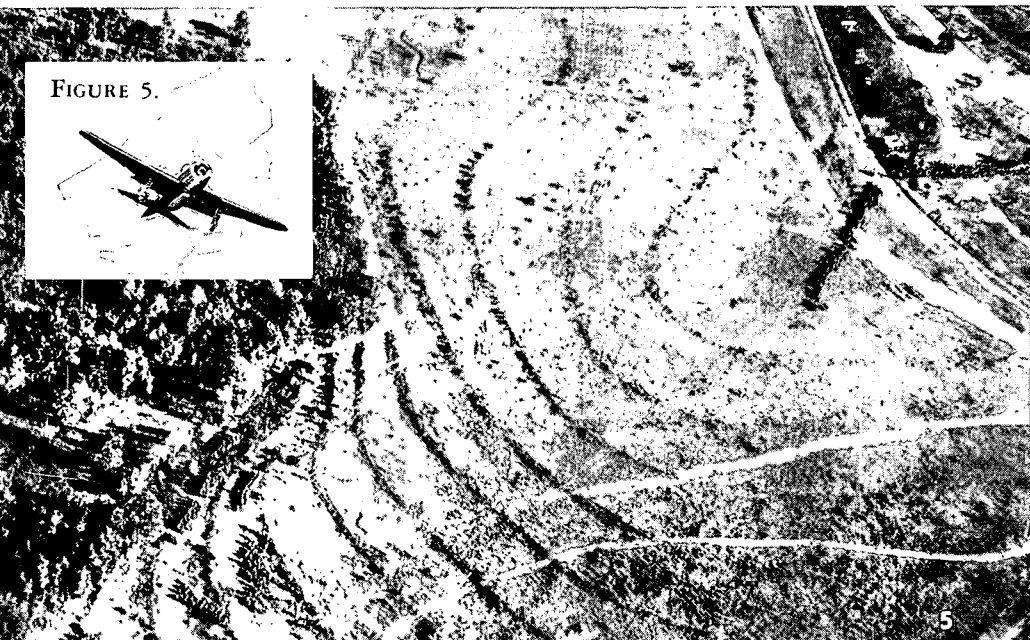


FIGURE 5.

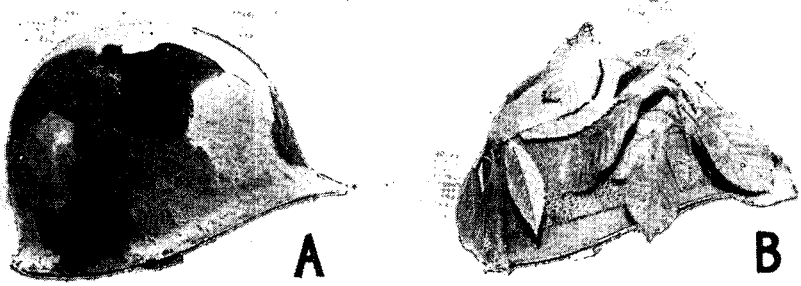
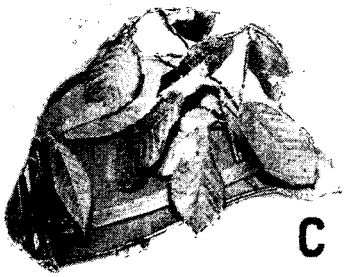


FIGURE 7.

HELMET CAMOUFLAGE

The outline of your helmet is one of the striking characteristics of a soldier's equipment. Its curved, familiar shape can be identified by the enemy. One of your first steps in preparing for the job of staying alive to fight is to disrupt both the form of your helmet and the strong, straight-lined shadow it casts. Here are six ways of disrupting its form, all of which, except **A**, will reduce its shine at the same time.

A uses a disruptive paint pattern on the helmet. Take care to carry the pattern across the curved lines of the edges, especially those seen from the front. Besides ordinary non-glossy paint, liquid vesicant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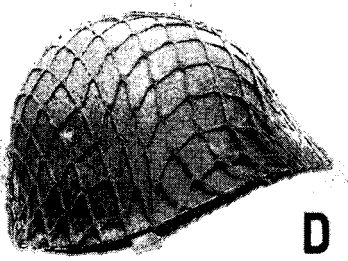

D

chemical agent detector, M5, can be applied to the helmet in a mottled pattern to give two kinds of protection at once. Under conditions of great heat or extremely rough handling, it may be necessary to renew this paint each week.

B uses a strip of burlap or osnaburg around the base of the helmet. Foliage can be slipped into the band and held in place. Do not use too much foliage. Do not place the band too high.

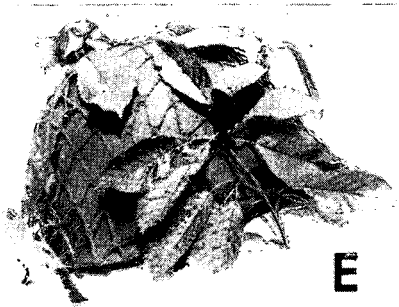
C uses the same principle as **B**, but here the issue rubber band is used.

D shows a helmet covered with a mesh helmet net. By itself, this net aids in toning down the helmet and eliminating some of the shine, but the shape of the helmet is still there.

E shows the helmet net put to better use. Foliage has been inserted in the mesh. It is held securely and can be quickly replaced with fresh materials when the old materials wilt and change color. The main point is to break up the shape of the helmet with short natural material which will not readily catch in surroundings and which will not disclose the head when it is moved slightly.

F is an improvised helmet cover made of a circular piece of osnaburg, burlap, or other cloth, 20 inches in diameter. A 1-inch hem is sewn around the edges, a tape or drawstring is pulled through it, and the whole thing is pulled tightly onto the helmet. It is painted to break up the solid color. Slits 2 inches wide have been cut in it to allow for the insertion of foliage.

No matter what kind of helmet camouflage you use, it is incomplete if the shadow underneath the helmet is not broken up by arranging the bits of foliage so that pieces of it hang over the rim of the helmet. Small irregular pieces of cloth, similarly arranged, will accomplish the same purpose.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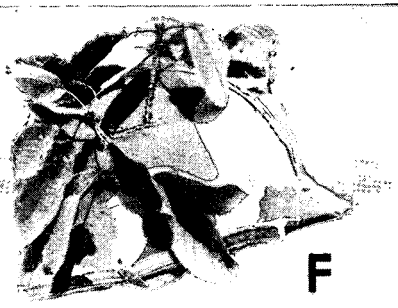
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FIGURE 8.

FIGURE 9.

SKIN TONEDOWN

Your face is light in color and, like your canvas equipment, is a beacon to the enemy observer — who usually has the sighting end of a rifle at his eye. Color your face, neck, and hands to get rid of that light tone (fig. 8). Gloves may be worn. Coloring may be done by painting them in a disruptive pattern (fig. 9), or it may be done by toning them down in an even color (fig. 10).

FIGURE 10.

On the face, disruptive patterns should cut across the nose line, cheek bones, eye sockets, and chin lines.

Lampblack, burnt cork, or just plain mud can be used as toning materials. Some soils contain harmful bacteria and should not be used in mud form to darken the face unless a medical officer has determined that they are safe to use.

A mesh mosquito face net (fig. 11), properly toned down, is an effective method of breaking up the outlines of the face. Such a net can be dyed in strong coffee or in an issue dye.

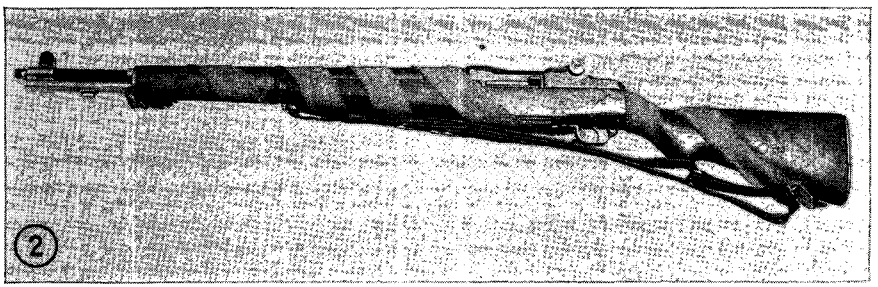
FIGURE 11.

SHINE

FIGURE 12.

WEAPON TONEDOWN

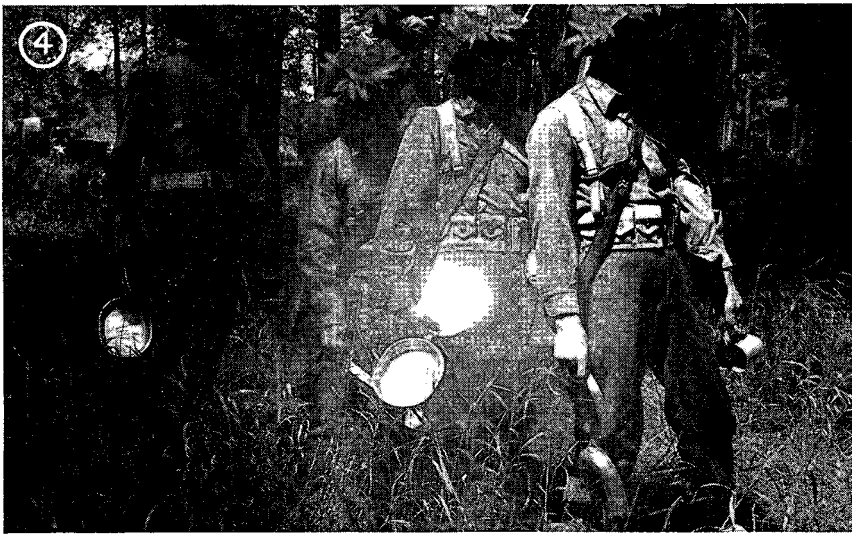
Even your weapons need some attention in the way of camouflage. The outline of the rifle or carbine is easily recognized. It may be painted properly under the supervision of an officer or noncommissioned officer, or it may be wound with tape or cloth of a grayed color to disrupt its outline. Leaves or other natural material wrapped with tire tape are effective. The bayonet can be toned down with mud. When camouflaged by painting, weapons and equipment must be darker than surroundings. Flat surfaces are roughened by adding sand to prevent shine.



SHINY OBJECTS

The reflection from a brightly shining object is a common giveaway. All shining articles should be concealed. Put your watch and shiny rings in your pocket, and keep that bright mess kit out of sight when you are not using it. Note the shine on the helmet.

3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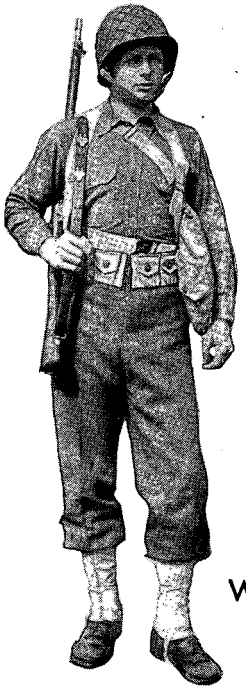
5

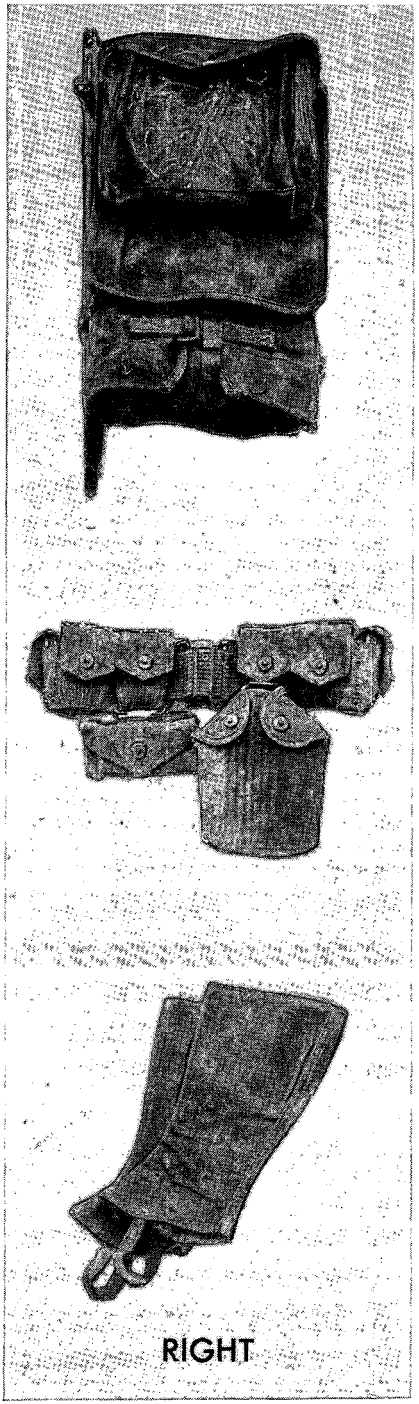
CANVAS EQUIPMENT



WRONG

FIGURE 13 ① and ②.

Clean canvas equipment is correct for inspections, but in combat zones such equipment is an invitation to a bullet. In motion, light-color patches are easy to spot. One of your first jobs in dressing for the job of fighting is to tone down (darken) the color of your canvas equipment. It can be done with paint, mud, charcoal, or anything else which will make the tone of the canvas about the same as the rest of your clothes. To color canvas to match the OD uniform, use OQMG No. 3, Compound for Coloring Web Equipment.



RIGHT

With the same materials, tone down (darken) the color of your pack, cartridge belt, canteen cover, leggings, and shelter half. The pictures on this page illustrate the difference such coloring makes. In figure 14 ① the soldier almost blends with the background, but those bright canvas articles stand out in the picture; they make excellent aiming points.

In figure 14 ② the soldier has darkened his canvas equipment. He is harder to see; the familiar outlines of his canvas equipment no longer stand out to the enemy observer.

FIGURE 14 ① and ②.

FIGURE 15.

CAMOUFLAGE CLOTHING

Individual concealment is mostly a matter of using your head and the materials at hand. This applies to camouflage clothing as well. When issue camouflage clothing is unavailable, the soldier makes his own, suiting its form and color to the terrain. Here one soldier is painting another's green twill fatigue uniform. A brush is not necessary. A dauber made with a wad of cloth on the end of a stick will do. Another method is to stamp the pattern on the cloth with a block of wood dipped in paint. But even paint itself is not essential. Any coloring material may be used—dye, black crankcase drippings, or even a mixture of mud and cup grease. The important thing is to make your clothes look less like a soldier's uniform and more like the terrain in which you will move.

However, a soldier is not invisible simply because he wears a camouflaged suit. The suit is just the *beginning* of the concealment job. It makes it easier for you to conceal yourself—but it makes it easier only if you know the other principles of individual concealment.

FIGURE 16. — Careful analysis of the background, before painting, produced these examples of camouflage suits improvised by a unit for use by observers and snipers in special terrain. A gray, rocky landscape suggests a snake pattern applied on fatigues dyed a light color.

FIGURE 17.—A different pattern is needed to blend this soldier with an area in a desert. Its irregular lines resemble the concealing pattern on the back of a turtle.

FIGURE 18. — In broken rocky country, this mottled pattern is effective concealment from enemy observation, ground and air. The soldier stays close to the objects with which he is blended. Such patterns are conspicuous when moving or against wrong background.

FIGURE 19.

FIGHTING CLOTHES

The issue uniforms are carefully designed to blend with a wide variety of surroundings under average conditions. For fighting at close ranges, special measures may be taken.

JUNGLE SUITS

The above soldier is wearing the jungle-patterned suit formerly issued by the Army, on request of a theater-of-operations commander, to troops engaged in jungle warfare. Its mottled pattern blends with the green foliage, and the outline of the soldier and his equipment melt into the background. The cloth cover which fits over the helmet has loops into which sprigs of foliage can be fitted to increase concealment. Wear the suit with caution, however, in extremely dark sections of a jungle because in this case the lightest colors in the pattern are especially noticeable during movement.

FIGURE 20.

The reverse side of the jungle suit is shown in figure 20. It is colored dark OD, which is the predominant color of jungle backgrounds.

FIGURE 21.

SNOW SUITS

For use in arctic country, the Army issues a snow suit, a two-piece garment, plain white, designed to blend with a white or mottled white-and-black background. Snow country isn't all white. There is some black in it; shadows and dark objects appear darker than usual. The suit cannot conceal the small patches of shadow which surround the human figure, but that is not necessary if the background, too, contains numerous dark spots.

CAMOUFLAGE CLOTHES AND THE TERRAIN

Pages 6 to 17 tell you how to go about dressing for the job of fighting. You won't always have time to do all the things that are mentioned, but you must find time to do the most important ones for the job at hand. The usual order of importance is from the top of the head down; that is, from the most frequently exposed parts of the body to the least frequently exposed parts. This will make the job of concealing yourself easier and the enemy's job of finding you harder, and they are worth every bit of time you can give them. Remember, though, that camouflage clothing and equipment alone won't conceal you; they must be used intelligently in accordance with the principles of scouting and patrolling (FM 21-45 and FM 21-100).

The rest of this book shows you how to use the terrain, how to move in it, how to make it work for you. With camouflaged equipment you are ready to make the most of the terrain.

BLENDING WITH YOUR BACKGROUND

Losing your silhouette in the silhouettes of things in the background and making use of the shadows in the background—no matter how small they are—are the primary means of blending yourself with your background. Be constantly aware of these two factors, *silhouette* and *shadow*.

From a concealment point of view, backgrounds consist of terrain, vegetation, man-made objects, sunlight and shadows, and color. The terrain may be flat and smooth or it may be wrinkled with gullies, mounds, or rock outcrops. Vegetation may be dense or nothing but little patches of measly scrub growth. The size of man-made objects may range from a sign post to a whole city street. There may be many colors in a single background, and they may vary from the almost black of a deep woods to the sand pink of some desert valleys.

Blending with your background means simply to match as many of these things as you can and to avoid all those with which you are in contrast. Remember, too, that your background is fixed. It cannot move with you. Whenever you move quickly against your background; you no longer match it. It is an easy way of attracting attention to yourself.

FIGURE 22.

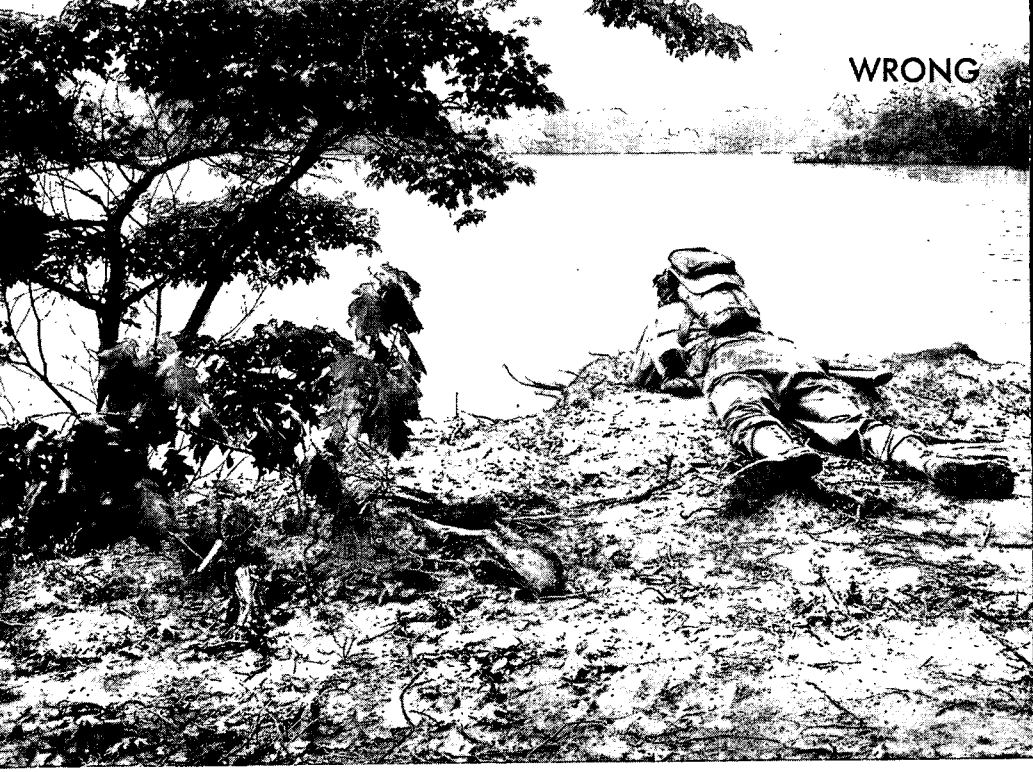


FIGURE 23 ① and ②.

SILHOUETTE

The soldier in figure 23 ① may think he blends with the ground — and he does. But look at his sharp silhouette against the bright river. Stay off such clearly defined edges. The correct way to look over the bank is with good background both before and behind you (fig. 23 ②). The enemy is no respecter of position. He won't stay in front of you to oblige you. Assume he is everywhere. Don't give him an opening like this.

FIGURE 24.

Avoid bright backgrounds of all kinds (fig. 24), especially when such backgrounds are unbroken by shadows and dark objects. In the same way, when you are in a light-colored uniform, avoid contrast with dark, shadowed objects (fig. 25). If you must be revealed against a contrasting background, be aware of it, and be there for the shortest possible time. Select your next point of concealment in advance and get there as quickly as you can.

FIGURE 25.

The soldier below has forgotten the first principle of concealment—background. He has foliage in his helmet, true enough, but it isn't anything like what is behind him. This doesn't conceal anything. It *attracts* the attention of the enemy.

FIGURE 26.

In street fighting, hug piles of debris which contain shadows. Stay on the shady side of such objects, and in the general disorder of an area like that in figure 27 you can stay hidden easily. In a rubble-strewn area, the thing which gives you away is movement. When you are forced to move, do it on the double.

Before firing, be sure your position won't raise dust and give you away. If you shoot from within a house, take a position that will raise as little dust as possible.

Figure 28 is a battlefield example of how to use natural materials. How many camouflaged soldiers do you find here? To fight beside these haystacks, the soldiers removed the foliage they used in the surrounding area and stuffed straw into their clothing and helmets. Now they melt into the haystacks, and an enemy will have a difficult time finding his target. Only the firearms are conspicuous.

FIGURE 27.

FIGURE 28.

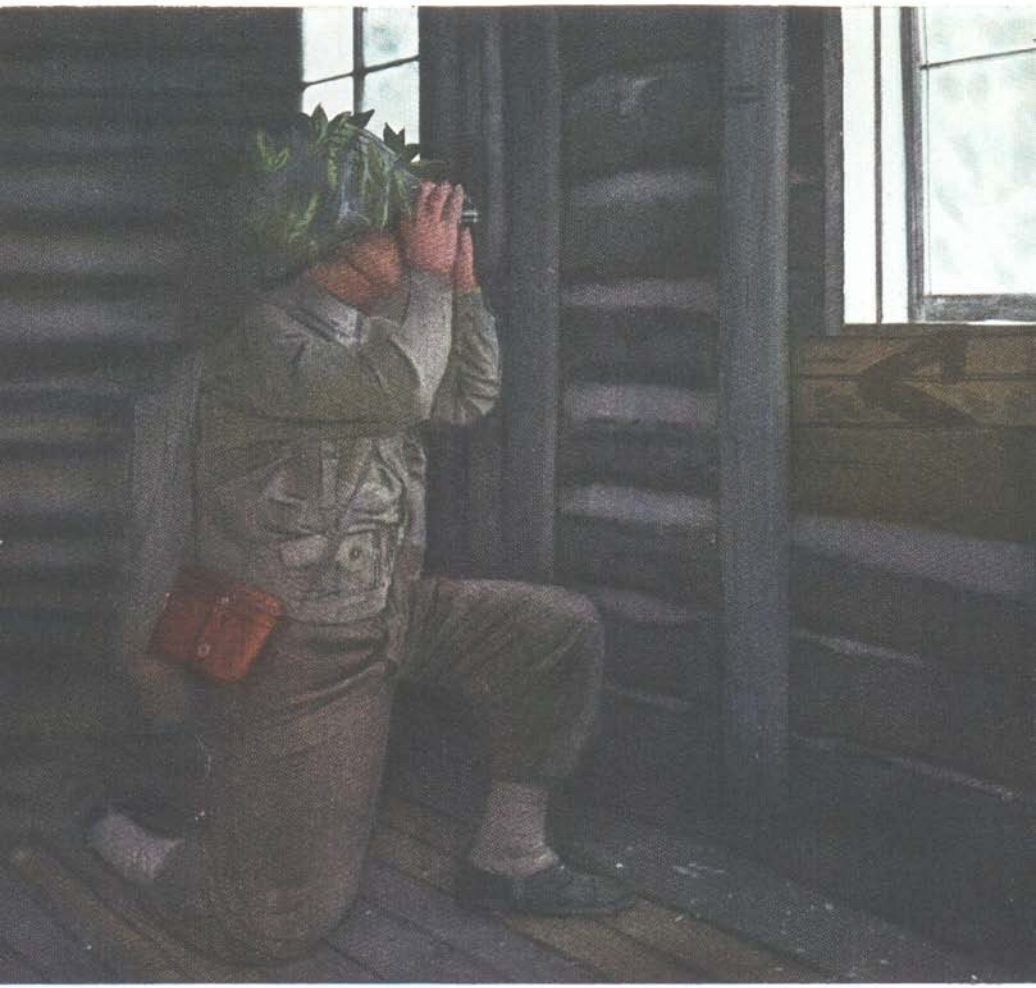


FIGURE 29.

SHADOWS

Shadows are part of every background. You can make them work for you if you know how to use them. They will work against you if you are careless or thoughtless.

When you observe from within buildings, as shown above, stand well back from the opening. Stay in the shadow. Your field of vision is more limited, but you will remain unseen.

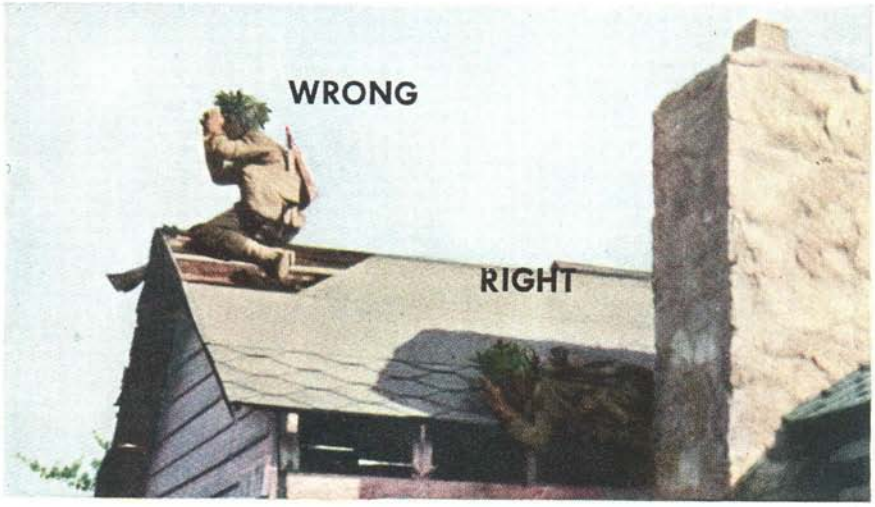


FIGURE 30.

When you observe, take care not to break the regular outline of a wall or building. Stay close to them and observe from near the junction of wall and wall, or wall and ground. In figure 30, the observer on the roof peak is unwisely exposed; note how inconspicuous is the observer in the shadow of the chimney.

Shadows of cuts and ditches (fig. 31) offer concealment during movement.

Heavy shadows (fig. 32) offer the best concealment when moving. This is especially true when you are subject to aerial observation.

FIGURE 31.

FIGURE 32.

FIGURE 33 ①.

Where there are clear expanses of unbroken ground, shadows are definite and revealing signs. Notice, in these figures, what stands out most. In figure 33 ① the soldier is too erect and the shadow he casts is large and conspicuous. In figure 33 ② he hugs the ground, keeping his shadow as small as possible.

FIGURE 33 ②.

Once again, the soldier has forgotten his background (fig. 34). He is in shadow, all right, but shadow doesn't conceal him when his background beyond the shadow is light. When you must move against an unfavorable background, stay close to the object which casts the shadow, so that the positions from which you can be seen against the light are reduced; and move *fast.*

FIGURE 34.

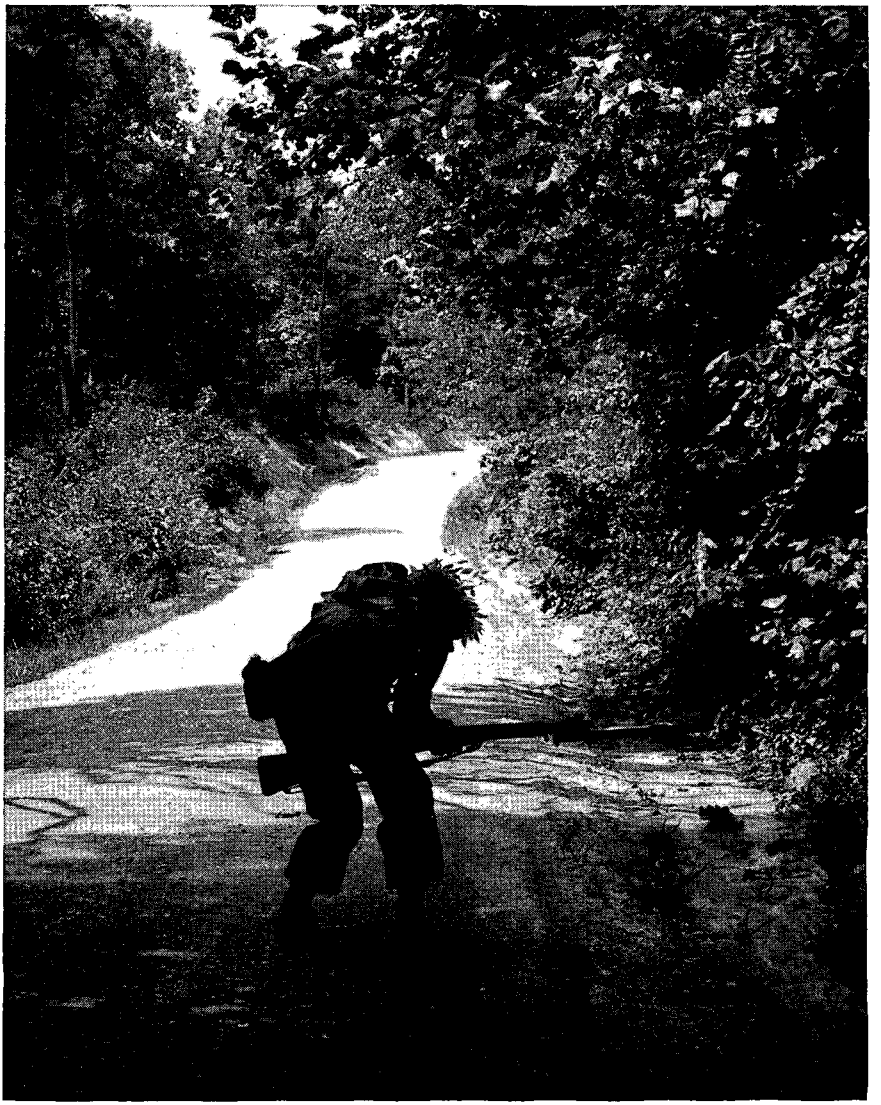


FIGURE 35.

ACTION AT NIGHT

The night isn't a protective blanket. You can see at night. Take it for granted that the enemy can too. Within half an hour in the dark the eye adjusts itself fully for night vision.

As in the daytime, silhouette and background are still the vital elements of concealment. A silhouette is always black against a night sky (fig. 35). Be just as careful at night as in the daytime about keeping off the skyline. If you are framed against a light road at night, you will make a sharp silhouette. On moonlight nights, take the same precautions as in daylight. Remember that the position of the enemy observer, and not the topographic crest, fixes the skyline.

FIGURE 36.

At night, sound is an important, revealing signal. Move carefully and quietly and stay close to the ground.

When a flare goes up, you must react instantly. Don't look at the flare. It will blind you temporarily. If you hear the pop of the flare before it bursts, drop to the ground and remain motionless. If the flare surprises you and goes off before you are warned, freeze in your tracks and keep your face downward (fig. 37). You may not be noticed if you remain still. Move, and you will draw a bullet. If you have time to move before the flare bursts, drop to the ground even though your background is unfavorable.

FIGURE 37.

FIGURE 38.

IN SNOW COUNTRY

Snow country is a mottled pattern of black and white more often than it is an unbroken expanse of white. Make the dark patches work for you by keeping close to them, as much as possible. Avoid a background of clear unbroken snow.

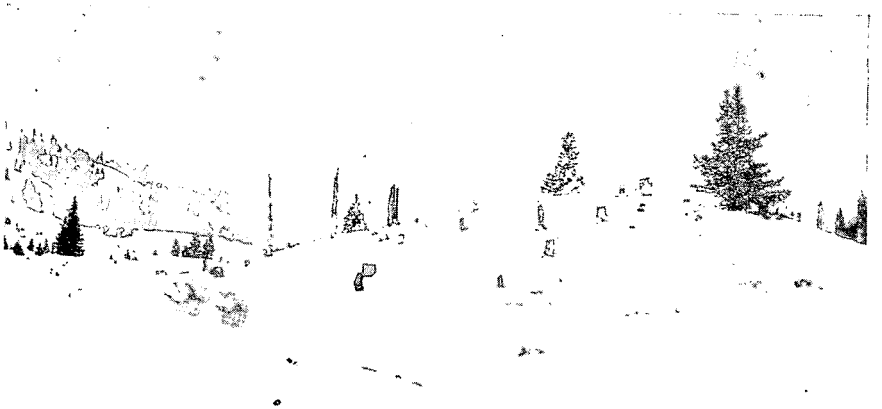
Take advantage of shadows. Even where there are no wooded areas or clumps of bushes, there are shadows made by ridges, drainage lines, rocks, and other terrain irregularities. Tracks are particularly hard to conceal.

FIGURE 39.

Uniform spacing between objects or personnel and straight lines formed by them are conspicuous in snow (fig. 39). Scatter; follow the edges of woods; don't make tracks directly to an installation.

Hit the ground quickly in battle (fig. 40). Break up the regular lines of your skis by throwing snow over them. A better route would have been along a stream or fence line.

FIGURE 40.



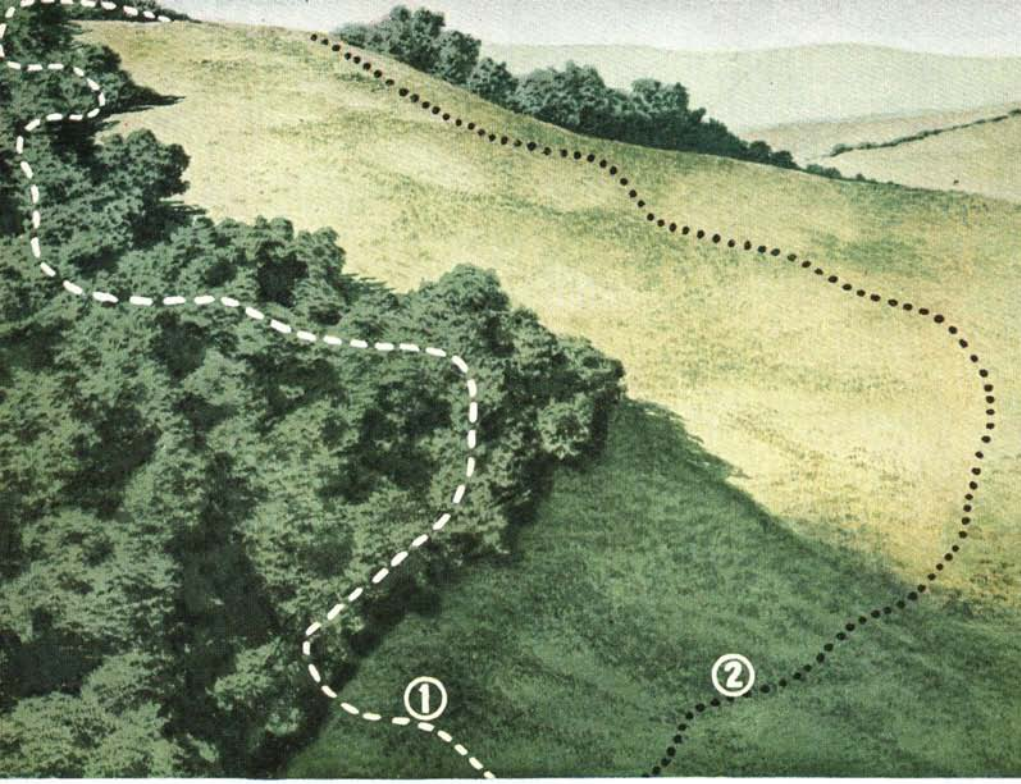


FIGURE 41.

MOVEMENT

Choose your route carefully by day and night. Make all possible use of screens, background, and shadow. Note Route ① for daylight. This assumes that there is fairly good undergrowth and shadow concealment against ground observation. Under favorable circumstances the enemy can see as much as 100 yards into an open wood. In this latter case, travel farther back from the edge. Woods with medium undergrowth also furnish numerous good observation points and cover. Heavy undergrowth is an obstacle to movement, and where rapid movement is more important than full concealment, movement by bounds along the outside edge and in the shadow of the woods may be possible. Where only a hedge or fence is available, and you can do so, move in the shadow. The less growth available, the more the necessity for crawling and running. In addition, movement over open ground is disclosed by tracks. Note Route ② for dark night. The reason for this is that it is difficult to walk quietly in the woods at night, easier for the enemy to surprise you. A dark night furnishes the shadow, and the route is chosen to give you background and keep you off the skyline. Light discipline

is essential. On bright moonlight nights, the shadow along the edge of the woods is probably the best route, but you lose security. Keep in low places in the ground. In any event, your mission, ease of movement, shadow mist, and background are controlling factors.

FIGURE 42 ①.

Observe from bushes large enough to prevent you from becoming an obvious target — observe through or under low branches — make movements slowly. Be sure that no part of your silhouette stands out against the background.

FIGURE 42 ③.

the enemy. It is almost always possible to cross a skyline without being seen by losing your silhouette in the silhouette of rocks, bushes, ditches, or other things which cause irregularities in the line. You should sprint across a skyline only when concealment is impossible.

Creep along fence lines and low vegetation — move slowly, silently.

Always choose the next point before crossing open areas. Then sprint for it, keeping body low and following a zig-zag course.

FIGURE 42 ②.

If skyline cannot be avoided, crawl to it — approach crest slowly, using whatever concealment there may be. How you cross the skyline depends on whether you are alone or with others, on how irregular the line, is, and on how much you have been able to learn about

FIGURE 42 ④.

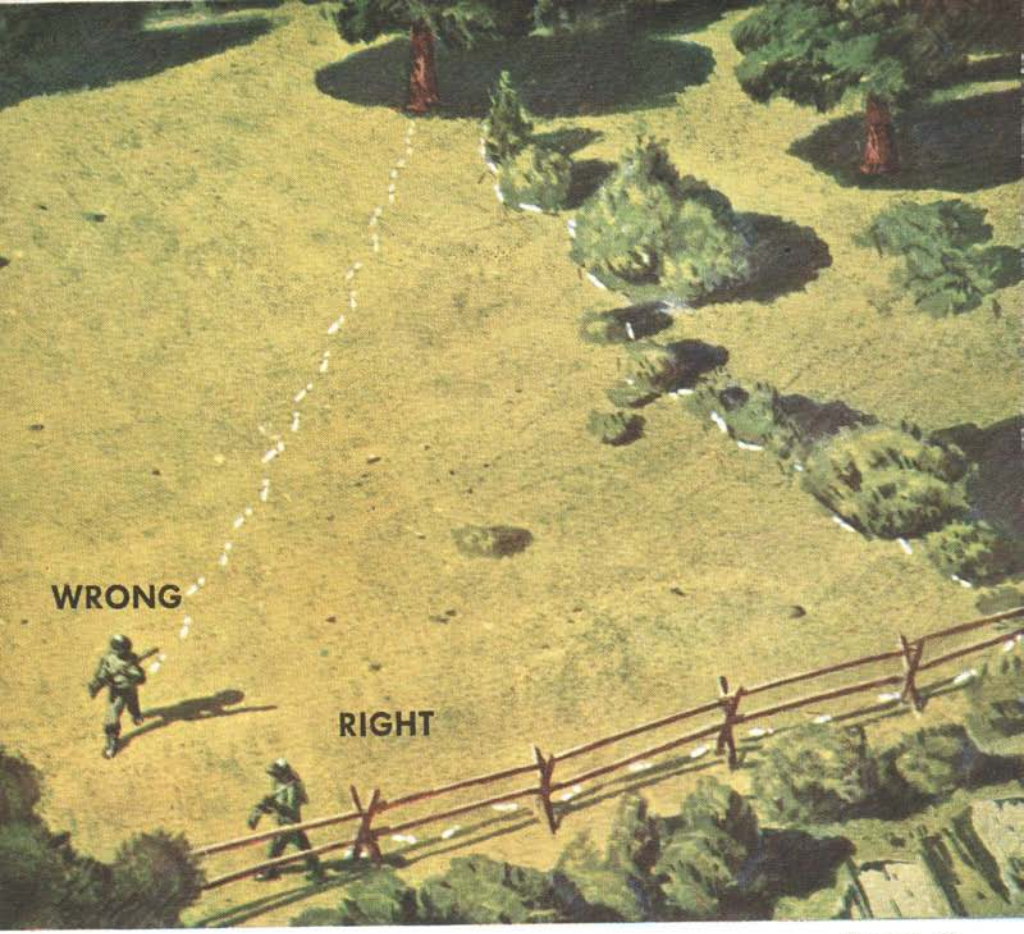


FIGURE 43.

CAMOUFLAGE DISCIPLINE

Always remember that you are a member of a team. Camouflage discipline is the most important part of individual camouflage because not only you but all your buddies in the unit will have to suffer for the mistake of one member. Concealing and maintaining the concealment of your unit is a cooperative responsibility shared by you and by every other individual in the unit.

From the air, such an innocent action as crossing an open field is easily observed. Your individual foot prints show up as a light line across such a field. Keep to existing paths in a bivouac area or position of any kind. Stay on the terrain lines—fences, ditches, hedgerows, roads, and paths already there. Be sure you understand the details of the camouflage scheme for your unit, and do your part in maintaining it.

Don't hang white laundry in open places where its bright tone can be easily spotted. Hang it under cover of some kind, and don't keep it there any longer than it takes to dry.

FIGURE 44.

Your shelter tent is a characteristic of the American army. Unless you camouflage it well, it will give away the position, and possibly the plans, of your whole unit. The black triangle formed by the interior shadow can be seen a long way off, especially from the air. Conceal it by striking the front tent pole or by covering the opening and the outline of your tent with natural materials. Never pitch a shelter tent in daylight unless you are ordered to do so.

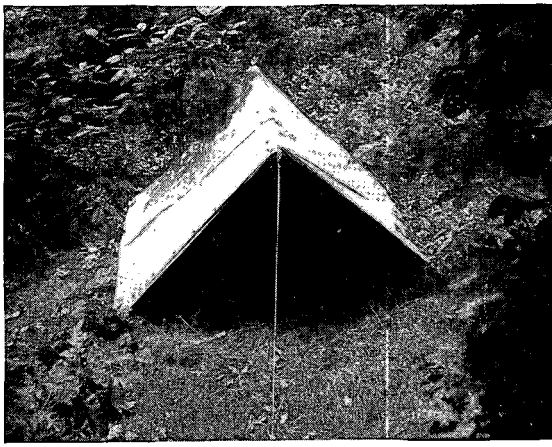


FIGURE 45.

REMEMBER THE PRINCIPLES

So far in this book, we have been concerned with the simpler things that make individual concealment possible. We have stressed the basic points of background and silhouette and shadow. You will find yourself in numerous positions not covered specifically in this book, but if you remember the principles we have covered, you can meet every situation successfully. One rule must be before you at all times. Don't relax, as long as there is a chance of your being observed. Practice concealment every moment of your life as a soldier. It will be a longer life and a safer one, and there will be more dead enemy soldiers behind you.

Part II

FOXHOLES

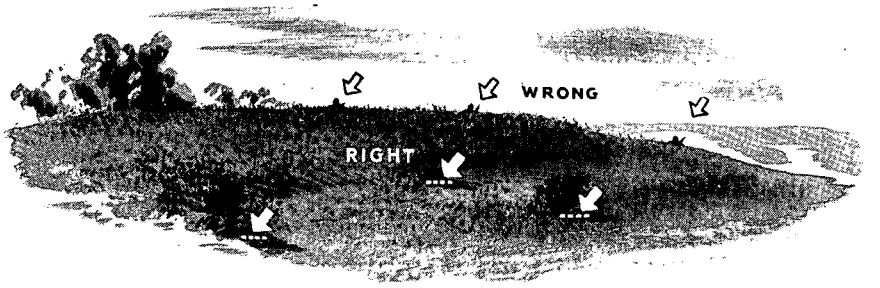
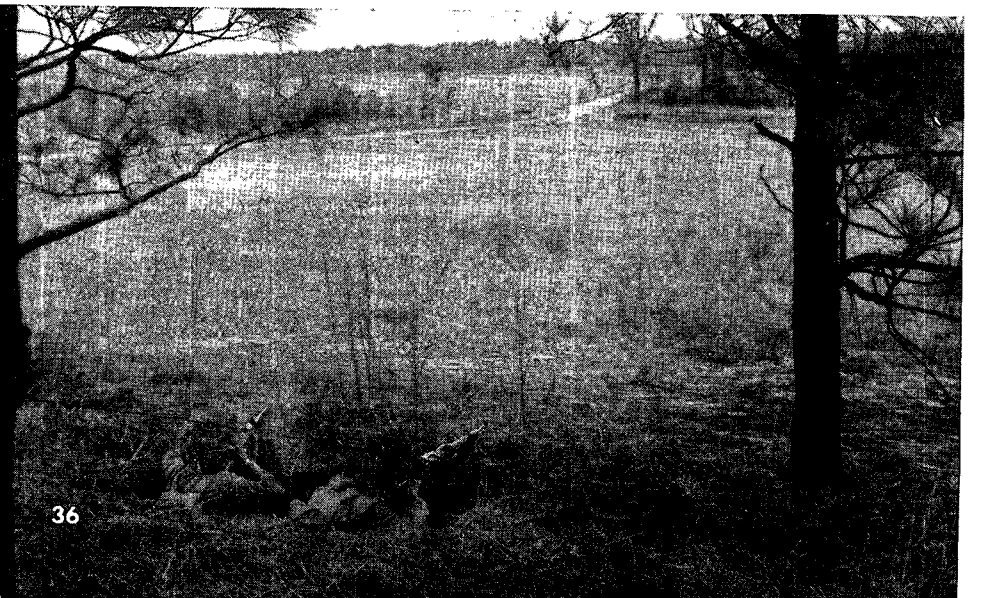


FIGURE 46.

Foxholes are the individual soldier's own fortified position. Such a position deserves every bit of attention to concealment you can give it. You are going to live in it for a time—a time during which it will be your main protection in a battlefield. Do everything you can to make it inconspicuous.

As always, after the demands of the military situation, background is the first consideration. Choose a place within the assigned area where the foxhole will not change the look of the terrain.

FIGURE 47.



Natural concealment is best. Keep both ground and aerial observation in mind. Against ground observation, site your foxhole so that you are not silhouetted against the sky or against a background of a contrasting color (fig. 46). Against air observation, site your foxhole under trees or bushes or in a dark area of the terrain (fig. 47). Make sure that your bush or tree is not isolated; a lone clump of vegetation is a conspicuous hiding place and will draw enemy fire whether he can see you or not. From the air, or from higher ground, spoil around a foxhole betrays the position. (fig. 48).

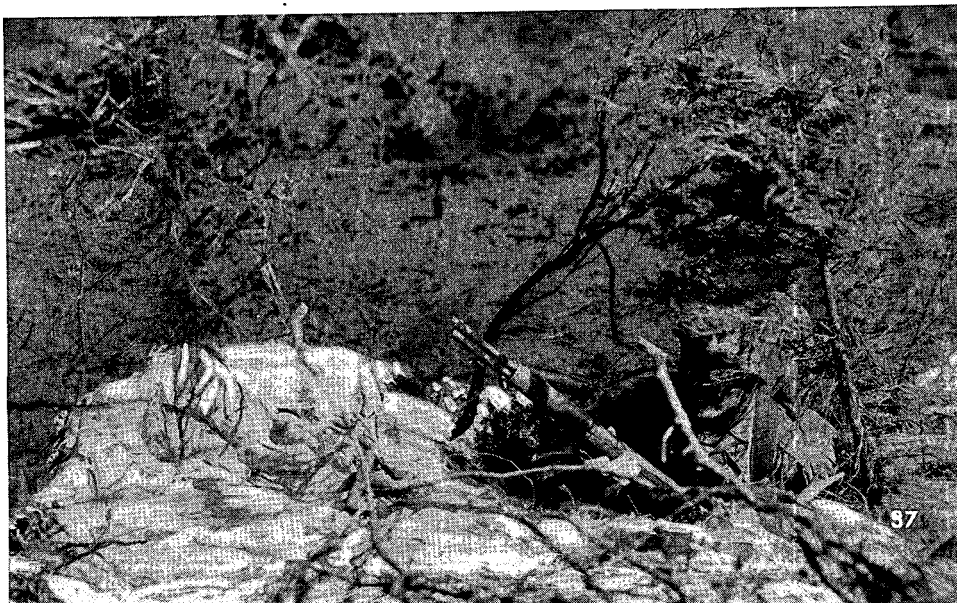
SPOIL

Dispose of your spoil from the foxhole. Carry it away in sandbags or shelter halves, if you have time. Dispose of it under low bushes, or dump it on dirt roads or paths, or in streams or ponds. This foxhole is concealed from the vertical air view by overhanging branches from a nearby tree.

If time or circumstances make it possible to dispose of spoil, cover it with natural materials. In figure 47, these soldiers have covered the spoil around their two-man foxhole with pine needles. This foxhole is sited under trees, concealed from both air and ground views.

Lines are always important in any terrain. Trenches sited along natural ground lines such as edges of fields, intersections of hedgerows, fences, and cultivation patterns are difficult to distinguish.

FIGURE 48.



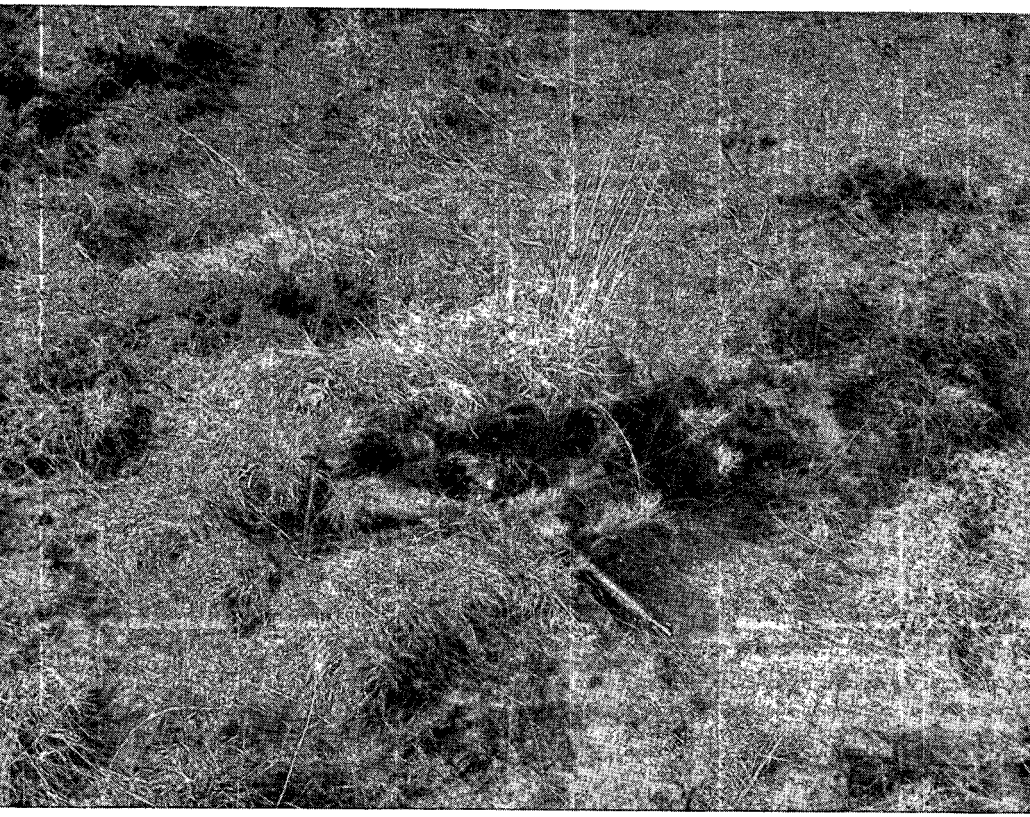


FIGURE 49.

FOXHOLE COVERS

Covers for foxholes can be made to simulate tall grass (fig. 49), bushes, and rocks, whichever the terrain calls for. They are valuable principally against aerial observation. They are light in weight and may be easily pushed out of the way.

The foundation of a foxhole cover is a frame (fig. 51) either flat or rounded—shaped from short branches bound together with wire, twine, strips of cloth, strips of woven reeds or dried grass. This frame may be garnished with grass or natural foliage to match the surroundings. Natural garnishing materials must be replaced before they wilt and change color. If this is not done the position will be in contrast to its background. Slits are left for firing.

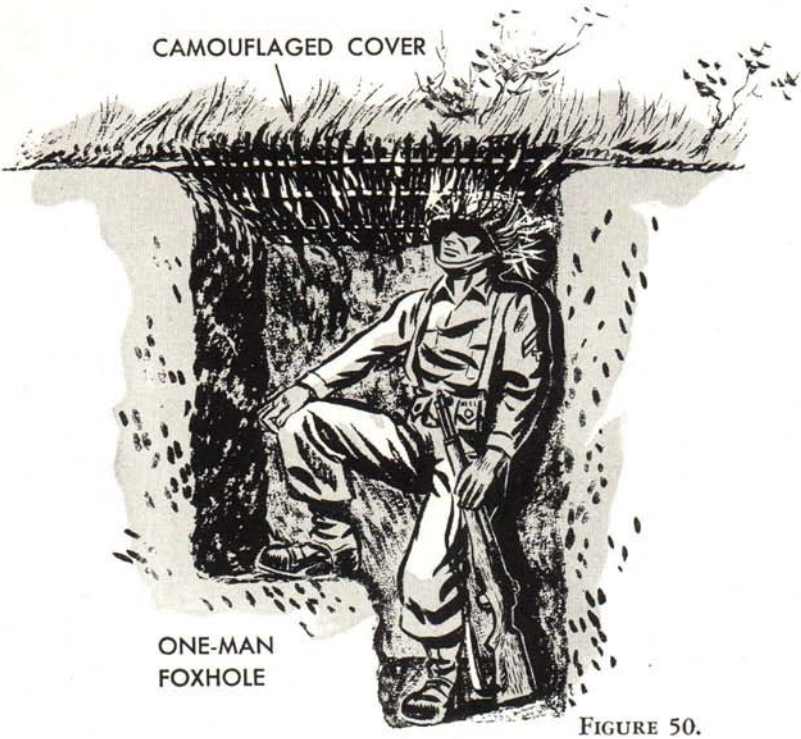
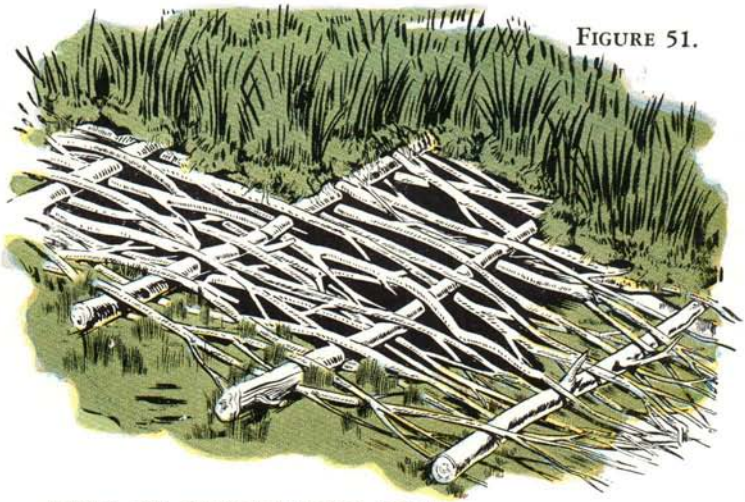


FIGURE 50.

FIGURE 51.



DETAIL OF CAMOUFLAGED COVER

FIGURE 52.

MACHINE GUNS

The machine gun is the vital weapon in both attack and defense. It receives the closest attention of enemy troops and its concealment must be as perfect as possible. It engages troops at comparatively close range, it fires frequently, and the enemy will continuously try to find and destroy the gun. Usually, machine-gun positions are hasty, in which case camouflage means siting to best advantage and then using natural materials at hand. The above photograph shows a machine gun well sited among natural materials. In the following pages are some of the methods used to camouflage machine guns. As before in this book, the essential factors are background and silhouette. No position can be regarded as completely concealed, however, unless shine, spoil, and tracks have been eliminated.

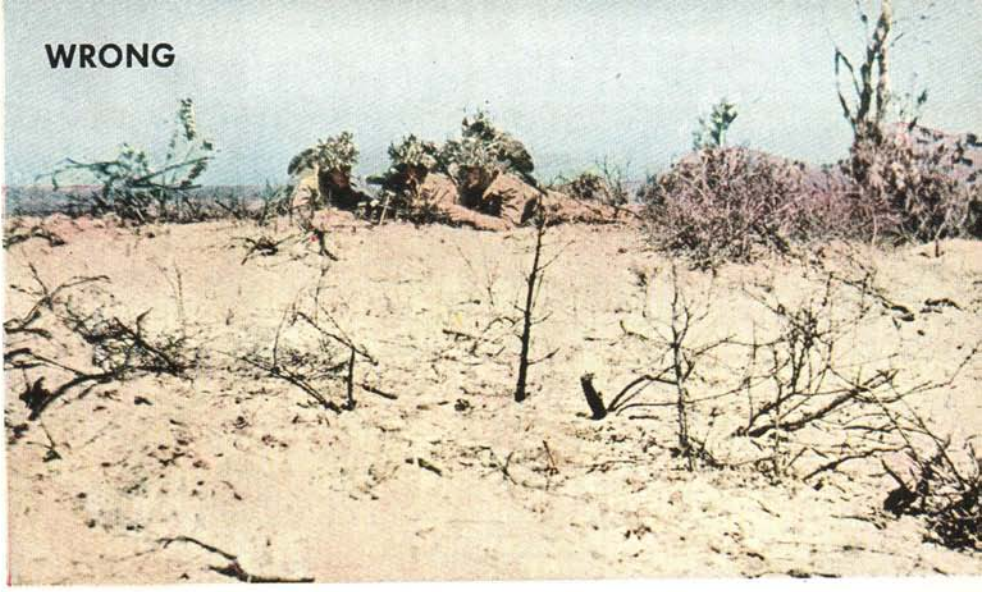


FIGURE 53.

BACKGROUND AND SILHOUETTE

In the above figure the crew has forgotten its background; the gun and gunners are silhouetted. Below, the crew has taken proper action to distort their silhouette, to blend the outline of the gun and its crew with the background. Foliage common to the area is used, and is placed in its natural position.

FIGURE 54.

FIGURE 55.

DEBRIS

Debris offers excellent positions for machine guns. The confused area makes it difficult to pick up the silhouette of a gun and its crew, especially if the position has been chosen with a good background. Figure 55 shows a well-sited, well-concealed position in debris.

Several factors must be taken into account in such an area, however. When the gun is fired, dust may be kicked up and betray the position to the enemy. If possible, take care to eliminate such a possibility by wetting it down. Debris is effective camouflage, but it should be sturdy enough to resist shock and fire. Otherwise it may collapse upon the position.

Also, an isolated patch of debris in a street is conspicuous. It is an obvious place for concealment and is sure to draw enemy fire whether he sees a gun in the position or not. Stay away from isolated positions of concealment.

Always have an alternate concealed position chosen in case you are required to move.

DRAPES

When the best position in the terrain is not good enough and natural materials are insufficient for concealment, artificial materials are used.

A simple, quickly erected camouflage device is the drape, made of shrimp net or of garnished twine net. Propped over the machine gun to distort its shape, it is erected near natural vegetation of some sort, with which it is "tied in" and blended. At close range the nature of the camouflaged object is concealed, and from a distance the drape itself melts into the surroundings.

Figure 56 illustrates a quickly prepared surface emplacement. The drape is thrown over the gun and blended with surrounding vegetation. This takes only a few seconds, but it does an effective job. The front of the drape has been lifted for firing the piece.

FIGURE 56.

FIGURE 57.

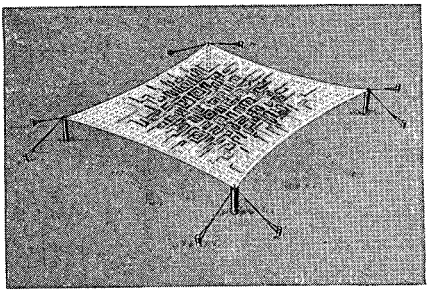
MACHINE GUN FLAT-TOP

The flat-top is an answer to the problem of concealing dug-in machine-gun positions. The simple flat-top illustrated above requires no framework. Its materials are four posts about 2 feet long, some No. 10 wire and a garnished 15- by 15-foot twine net.

Corner posts are not driven; they rest on the ground and are held in place by double strands of No. 10 wire, tightened by racking. When wire is not available for guys, tent-guy ropes will do the trick. Corners of the net are slipped over the posts before racking. To dismantle the flat-top, the corner posts are knocked out and the net collapses.

The figure below shows the completed job, with natural foliage used to break up the shadow of the gun embrasure.

FIGURE 58.



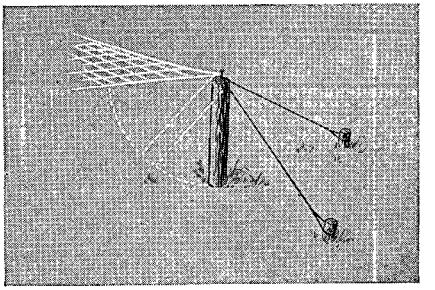


FIGURE 59 ① and ②.

Figure 59 ① shows the detail of the flat-top illustrated in figures 57 and 58. Note the garnishing is thinned out at the edges; the whole structure is as low to the ground as possible. Figure 59 ② shows the corner posts and the manner in which they are guyed to the ground.

This small flat-top may be made out of improvised materials as well. Below (fig. 60) is the flat-top garnished with natural materials —tall grass from the surrounding area. This is especially effective in areas where wilted and dried vegetation form the background. If background is formed of growing vegetation, the garnishing must be changed regularly to prevent wilted materials from revealing the installation.

Such an improvised flat-top may be made, in the absence of issue twine net, by using tent ropes or vines to form framework.

FIGURE 60.

FIGURE 61 ①.

BUGGY-TOP

For a deliberate position, especially in terrain with natural foliage, the folding buggy-top (fig. 61 ①) conceals the machine gun which has an antiaircraft or all-around fire mission. It can be folded back quickly, allowing the gunners to engage aerial targets (fig. 61 ②). When it is folded back, the whole structure lies flat on the ground.

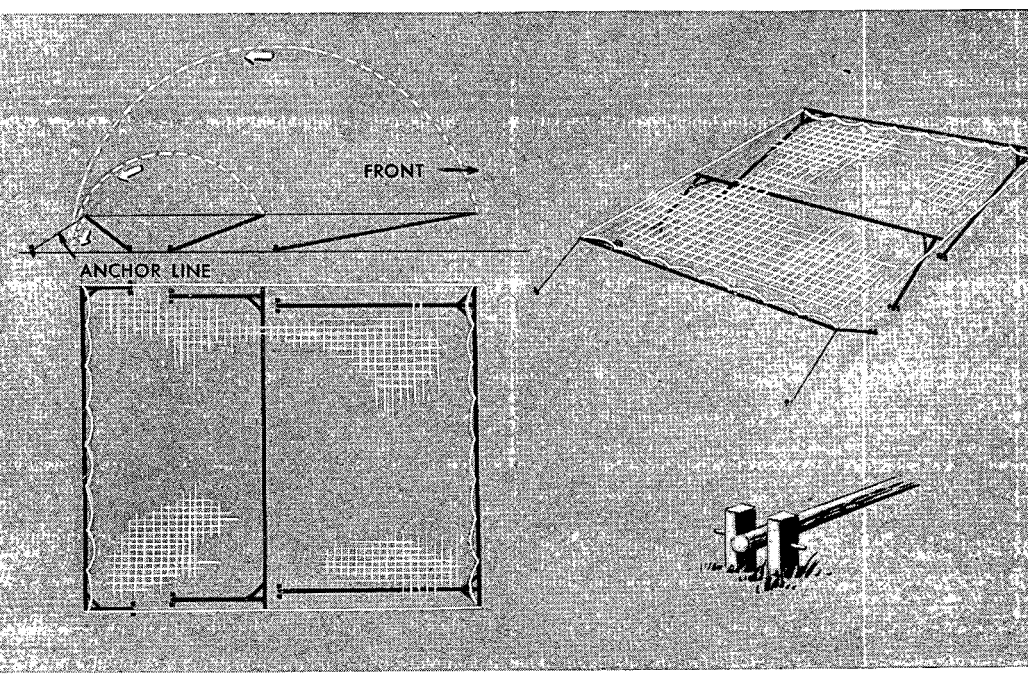
Construction details are shown in figure 62. The frame can be made of pipe, saplings, or lumber. Hinges are made either of No. 10 wire, stakes pivoted on a pin made of wire or a driftpin, pieces of scrap leather, or stock door hinges.

The net is a 15- by 15-foot garnished twine net.

Take care that the vegetation around the position is not compressed by the buggy-top when it is open. If the vegetation does become damaged, steps must be taken to restore its natural appearance. To complete camouflage (fig. 61 ①), small bushes must be placed irregularly around edges of net.

FIGURE 61 (2).

FIGURE 62.



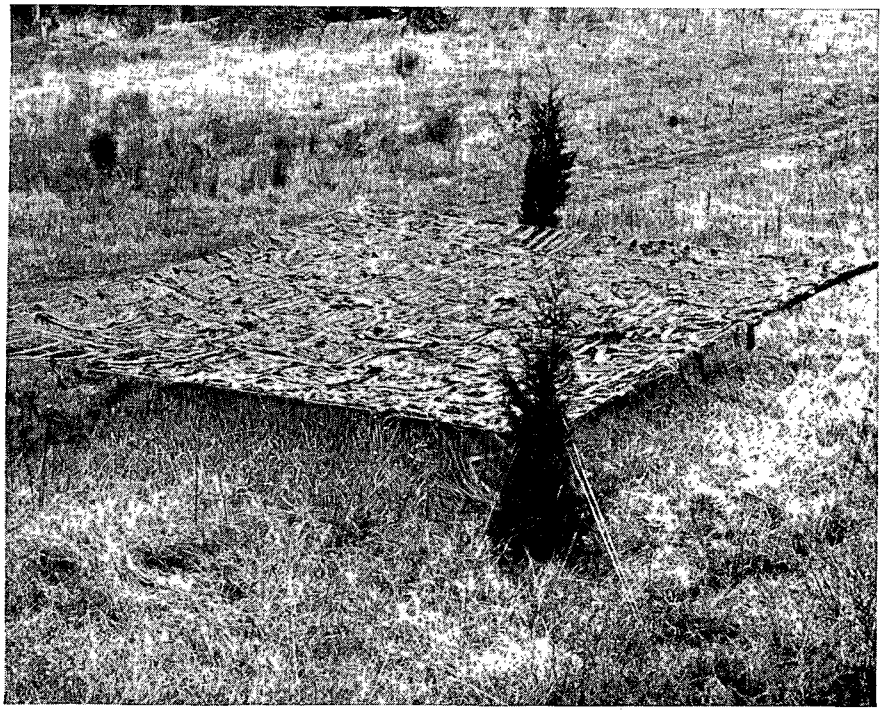


FIGURE 63 ①.

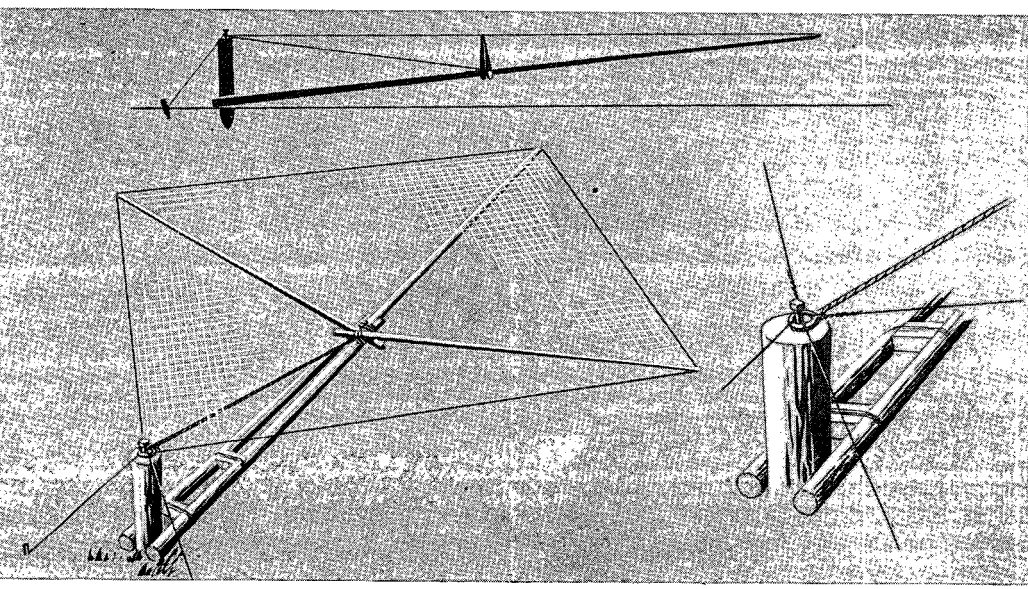
SWINGING FLAT-TOP

In a deliberate position, the swinging flat-top, figure 63 ①, is a slightly more elaborate flat-top for antiaircraft machine guns. It is a cantilever structure hinged on a post at one corner. It is easily pushed to one side, giving the gun an unobstructed view of the sky (fig. 63 ②).

It, too, uses the 15- by 15-foot garnished twine net. This flat-top pivots on a simply constructed hinge, as illustrated in figure 64. Although the cantilever construction demands a slight upward slope from hinge to outer edge, to equalize tension and pressure on the post, the whole structure should be as low to the ground as possible.

FIGURE 63 (2).

FIGURE 64.



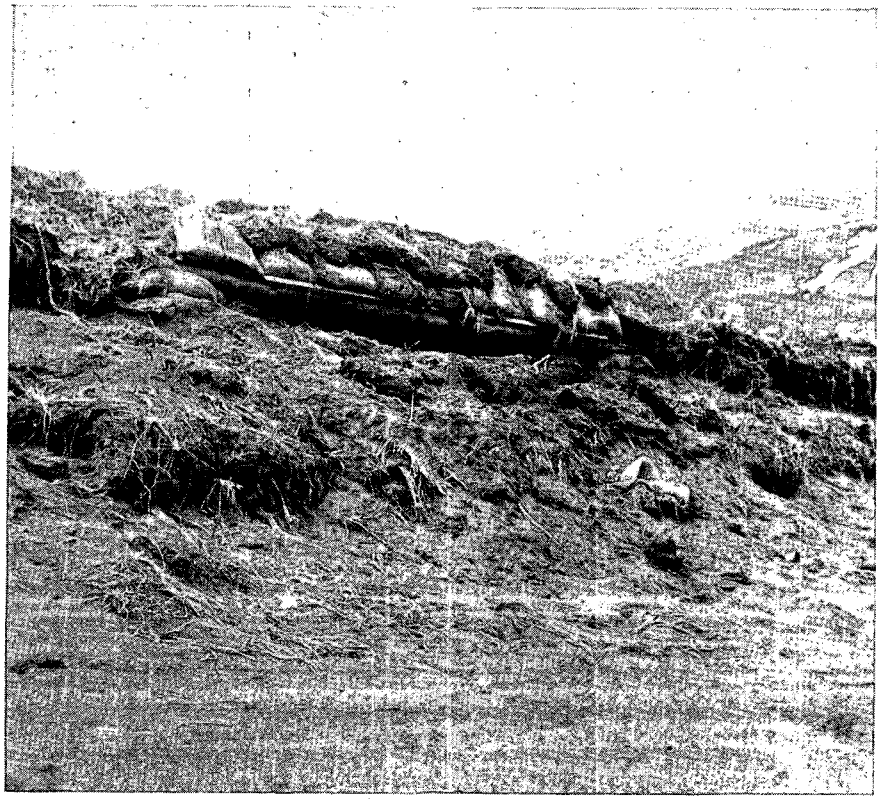


FIGURE 65.

DUGOUT POSITION

Figure 65 shows a dugout machine-gun position in a battle area. It illustrates how much concealment can be gained by a good job of siting and the use of natural materials. The embrasure of the emplacement is now conspicuous as this photograph was taken after the Japanese position had been occupied by American troops. There is every indication that sod and long grass were allowed to conceal the black shadow made by the embrasure at the time that it was in use by Japanese forces. The sod on the right of the photograph is still well placed in accordance with accepted camouflage procedure and effectively conceals that part of the opening. This pit was dug first and then covered so that the silhouette of the ridge appears to have been undisturbed. The entrance is in the rear. Sod placed over the sandbags around the embrasure would have increased the effectiveness of the position. The sod on the right is well placed and conceals that part of the dugout effectively.

Figure 66 is a skillfully constructed and camouflaged dugout-and-sandbag machine-gun emplacement in a tropical theater of operations. Note the low silhouette, the care in keeping the embrasure as low and as small as possible, and the excellent use of natural materials.

Figure 66 ① is the front view; figure 66 ② is the rear view, showing dugout entrance after natural materials have been removed from doorway.

FIGURE 66 ① and ②.

FIGURE 67.

MORTARS

Mortars should always be sited in defilade. Since a mortar covering a designated target area has a wider choice of position than other small weapons, such defilade can almost always be found, and concealment from ground view is fairly easy. The aerial observer is the enemy's principal means of discovering the position of mortars, and the mortar must be well camouflaged against the aerial observer as well as against the possibility of enemy flanking action.

Siting in shadows and broken ground patterns, plus intelligent use of natural and artificial materials, offer the mortar concealment from the air.

FIGURE 68.

FIGURE 69 ①.

A foxhole emplacement for a mortar needs camouflage. Without camouflage, it is much easier to detect than a hasty position. In figure 69 ① the crew has dug its foxholes carefully, concealed the amunition and spoil, and pulled grass in around the emplacement. Care must be taken not to make giveaway tracks in this kind of terrain.

Figure 69 ② shows what could have happened if the job were done by a badly trained crew. This position has taken no advantage of the characteristics of the weapon and made no provisions to conceal the ammunition. Spoil from the foxholes marks the place for aerial observation. The crew has not taken best advantage of their position. Their equipment is not toned down; no attempt has been made to use natural materials on their helmets; and their faces and hands have not been toned down.

FIGURE 69 ②.

FIGURE 70.

SITING

The figures on this page show excellent choice of position and use of existing natural concealment. The position above is in a creek bed under a fallen tree. The men and mortar are concealed from overhead as well as flanking views.

Below, position in heavy foliage is well hidden. From the air it would be difficult to separate the position from the foliage pattern.

FIGURE 71.

CONCEALING A MORTAR EMPLACEMENT

Progress stages in the camouflage of a dug-in mortar emplacement. The upper photograph shows the foxhole dug quickly for immediate protection. As yet there is no concealment. However, although crew are exposed, the position itself is well chosen, spoil has been disposed of carefully, and tracks to position follow concealed lines.

Next, forked sticks support branches to form the framework for concealment. Natural foliage is placed on this framework.

In the third photograph the finishing touches are being put on the position. Surrounding live vines are being pulled over the emplacement.

The last photograph shows the finished job. The emplacement is ready for effective, concealed fire.

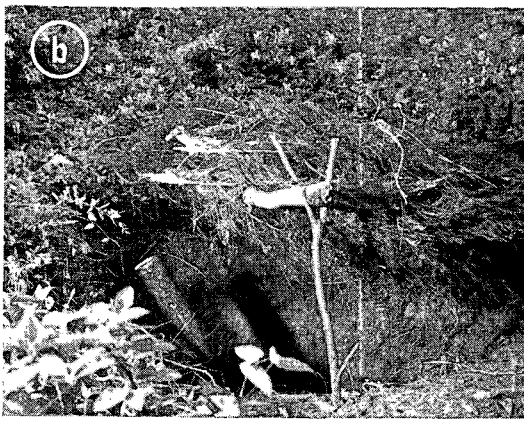


FIGURE 72.

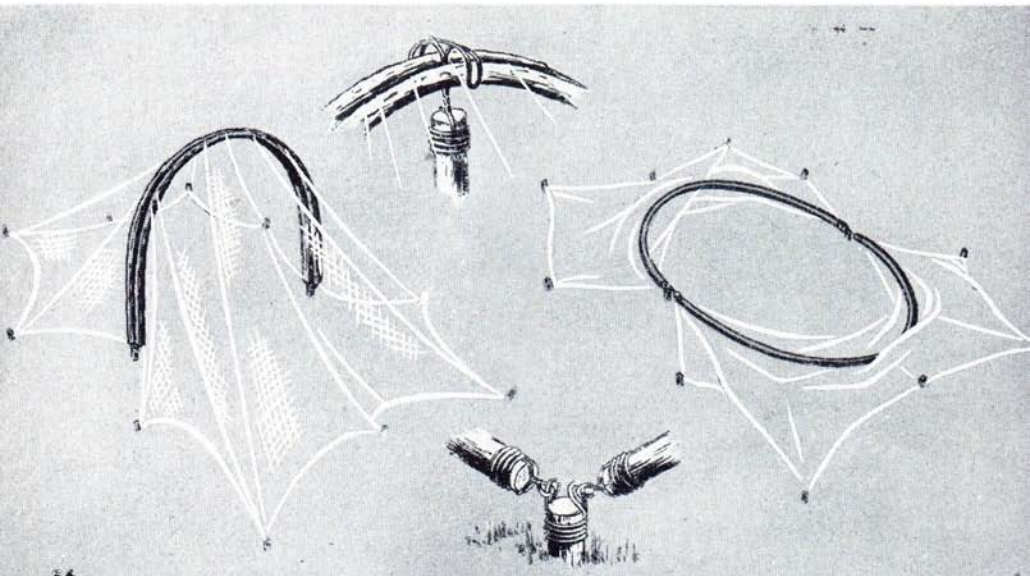
FIGURE 73.

AN IGLOO

In deliberate positions, where the emplacement cannot be dug in and the terrain is broken with bushes and rocks, an igloo (fig. 73) is an effective quick-opening cover for mortars. Simply constructed, it is made of two garnished twine nets, each 15 by 15 feet, two sapling bows, and some wire for hinges.

A wire hook holds the top of the bows together when the igloo is closed. Lifting the hook permits igloo to fall apart. Construction details are shown below.

FIGURE 74.



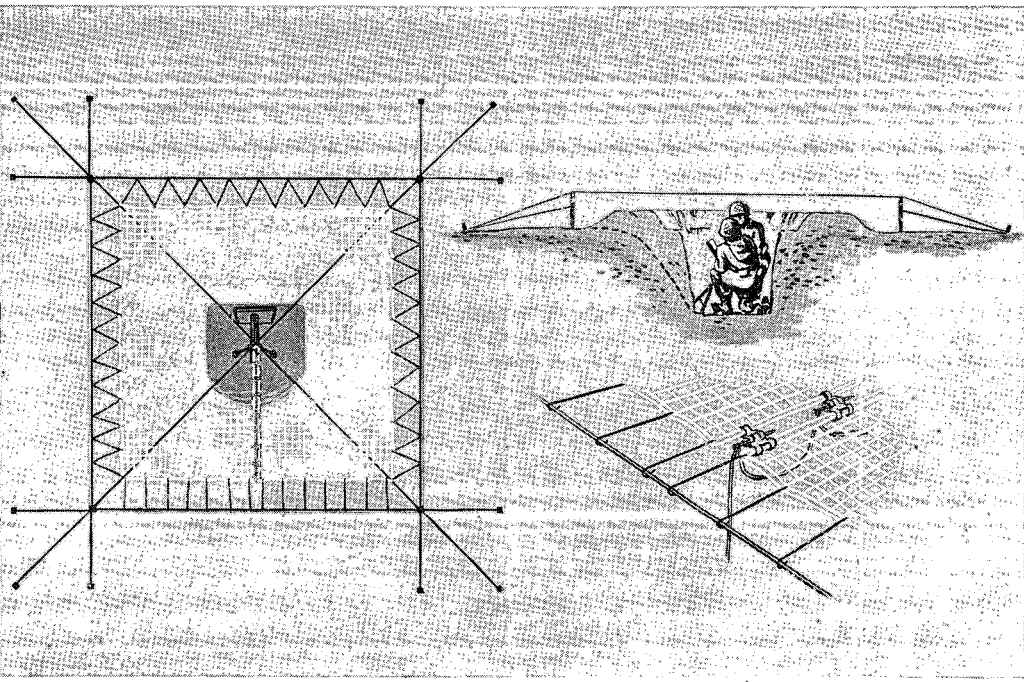


FIGURE 75.

FLAT-TOP

In open terrain with little vegetation, the flat-top with an embrasure can be used for overhead cover. A 15- by 15-foot garnished net is suspended from an 18- by 18-foot No. 10 wire frame by a lacing of No. 16 wire or rope. On the side toward the enemy, a quick-opening embrasure is cut in at least 6 feet. The cut edges, reinforced with rope or wire, are fastened with a circus tie of rope or with any other quick-release fastening.

Construction details are shown above.

Wire hooks hold the embrasure side of the net to the wire frame. When the embrasure is opened, the hooks are released from the frame. The frame is tightened by racking the double guy wires at corner posts and by racking the two diagonal wires together at their crossing.

Spoil should always be removed and hidden. A flat-top will rarely conceal piles of spoil around an emplacement, especially when they are near the outer borders of the position.

ANTITANK GUNS

The effectiveness of an antitank gun depends upon surprise. The gun must be concealed until it fires, and it should remain difficult to detect after it fires.

Camouflage of antitank guns is largely a matter of good siting. Positions should be chosen which offer the gun good background against which to blend. They should not be sited in a conspicuous spot, such as isolated bushes or piles of debris in an open area.

FIGURE 76.

FIGURE 77.

Well hidden in natural foliage, which may offer numerous places for concealment, the antitank gun has an advantage over the exposed tank. Positions in natural cover—see above photograph—should always be looked for. Here the crew has increased concealment by adding cut branches.

FIGURE 78.

GUN SHIELDS AND DRAPES

The angular shape of the 37-mm gun shield is conspicuous to the tank observer. If a simple panel, made of wood or wallboard cut in an irregular shape, is attached to the top of the gun shield, it will be easier to blend the gun with natural foliage. This reduces the amount of natural materials which need be added to disrupt its forms. A few branches at characteristic areas, such as the wheels, complete a hasty concealment job.

The 57-mm antitank gun shield—see above photograph—is already equipped with a scalloped edge. Painting the shield to match the background increases its effectiveness. The problem of concealing the 57-mm gun is basically the same as that of the 37-mm gun.

The above photograph shows a 57-mm gun wheeled quickly into position in bushes. No attempt has been made to camouflage the gun here, yet note the effect of the scalloped gun shield; it is not an angular line. From a distance of 100 yards or more, even an uncamouflaged gun, well sited, is inconspicuous. The gun crew, whose heads protrude above the shield, are hard to detect because their helmets are well camouflaged with natural materials.

Artificial materials are often necessary to supplement natural concealment. A position can be temporarily concealed by means of a quickly erected drape made of issue shrimp net or garnished twine net, 29 by 29 feet. It should be used where its irregular shape can be blended into the background. Figure 79 ① shows a dug-in fan-type position, well sited, but without a drape. Figure 79 ② shows the same position with a garnished twine net drape. Correctly propped over the gun to allow sufficient headroom, the gun may be fired and serviced with the drape in place. An embrasure is made by slitting the net and propping the sides of the opening, or, if necessary, the whole drape may be quickly thrown back (see fig. 80 ②) to allow unhampered action by the gun crew. Often branches can be tied together overhead. The addition of natural foliage (stuck in the ground) will mask gun-blast marks.

FIGURE 79 ① and ②.

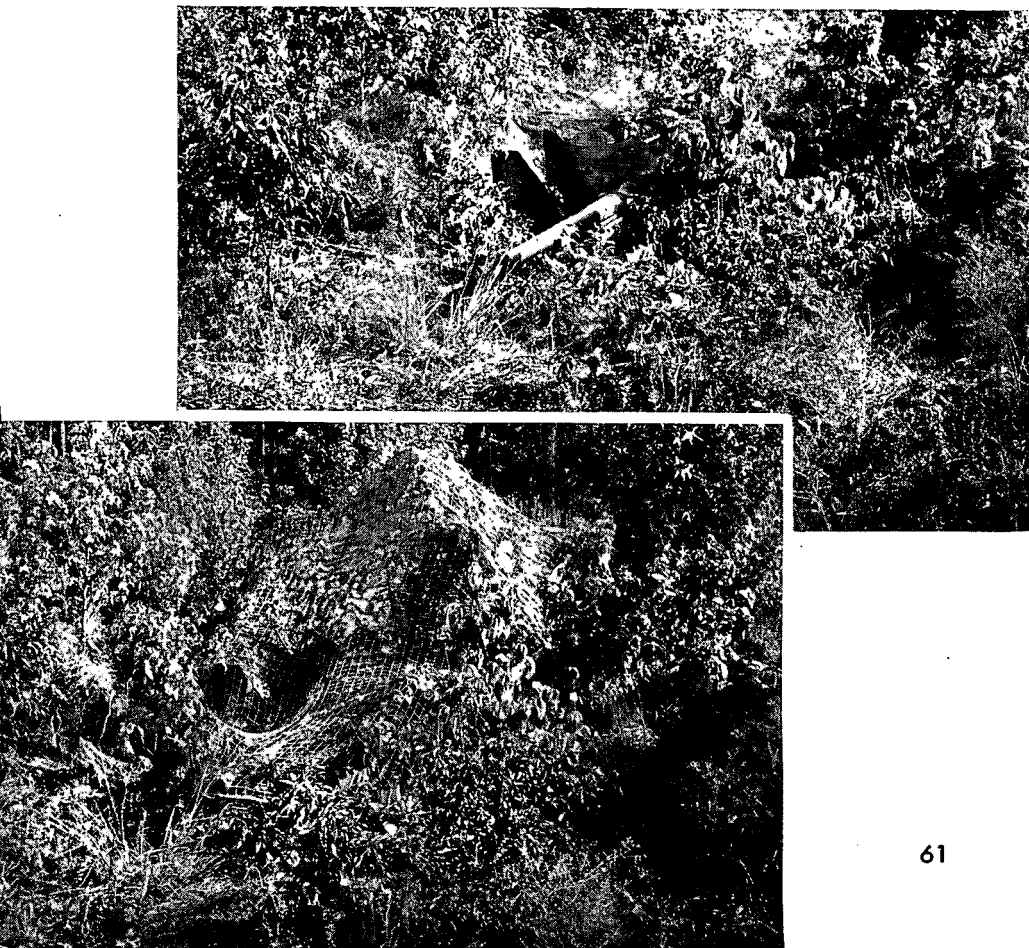


FIGURE 80 ① and ②.

DRAPES

In a comparatively open area with moderately high grass, an emplaced antitank gun can be rendered inconspicuous from ground observation and concealed from aerial observation. The drape should be replaced by a flat-top as soon as the situation will allow. Above, the drape in place; below, the drape thrown back as the crew goes into action.

A well-concealed gun emplacement can be betrayed by a careless crew. The crew is part of that emplacement; they must not be allowed to move about in the open, to track up the surrounding area, or otherwise to attract attention to the position.

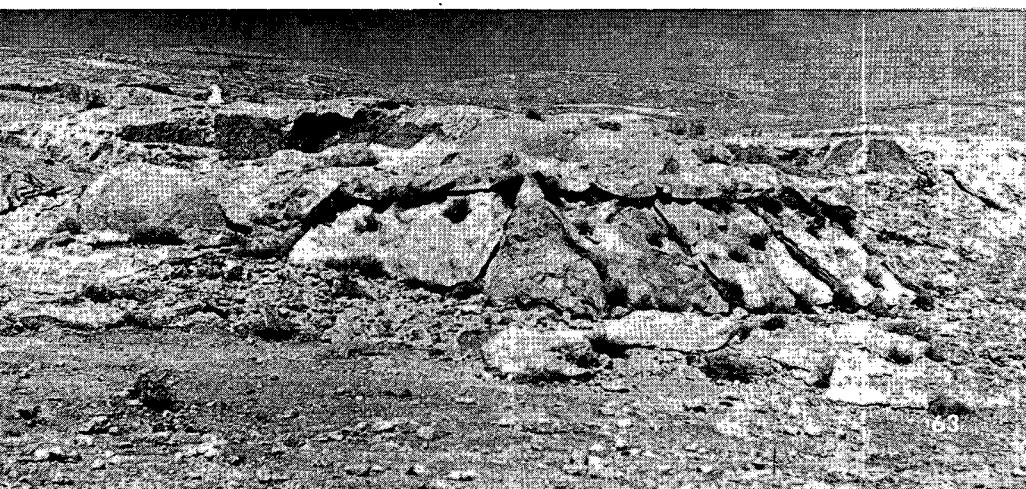
FALSE ROCKS

Battlefield examples of well-concealed deliberate antitank positions are shown on this page. In figure 81 ① the area is a confusion of small rocks. The emplacement is concealed with false rocks made of cloth sacks, stuffed with a light-weight material, such as paper, colored to match the real rocks, and attached to a chicken-wire screen (fig. 81 ②). In figure 82, artificial rock slabs, typical of the area, have been made from strips of fabric stiffened with flour and water, applied to a chicken-wire frame, and colored to match the surroundings.

Engineer Camouflage Battalions are trained to teach these tricks as they are needed in the field. Extra supplies are then drawn from the Engineer Depot or supply point.

FIGURE 81 ① and ②.

FIGURE 82.



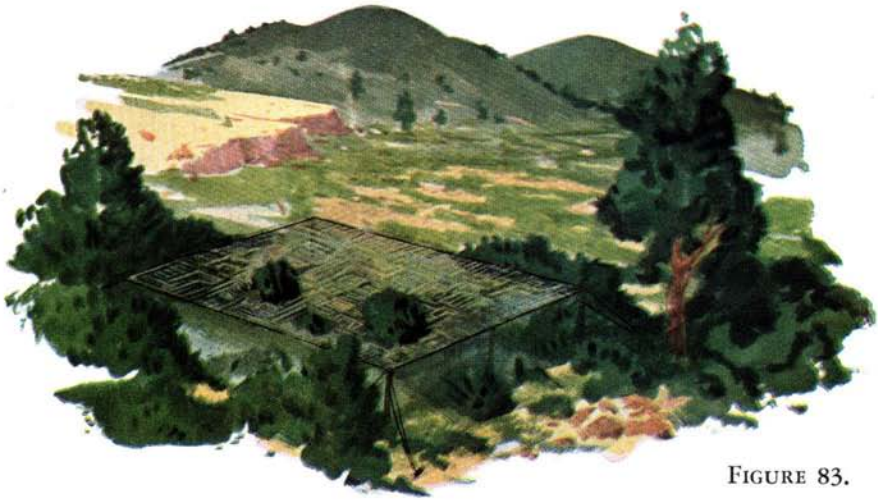


FIGURE 83.

FLAT-TOP

A well-constructed flat-top gives an antitank gun excellent concealment from aerial observation (fig. 83). But the targets of the gun approach on the ground, so the emplacement must be sufficiently well sited and well supplemented with camouflage to be concealed from ground observation.

After the field of fire has been checked, a flat-top should be erected before the emplacement is constructed so that digging activities are concealed.

The antitank-gun flat-top uses a 29- by 29-foot net supported on a 32- by 32-foot framework of No. 10 wire and six posts. The height of the flat-top should be as low as possible. This will vary, depending on the height of parapets around emplacements as specified in different theaters of operations, but it should never be above the surrounding vegetation.

First step. Drive posts and stakes according to the plan shown in figure 84 (a). The posts are driven in just far enough to hold them up and are slanted inwards about 18 inches. The emplacement should be in the center of the layout.

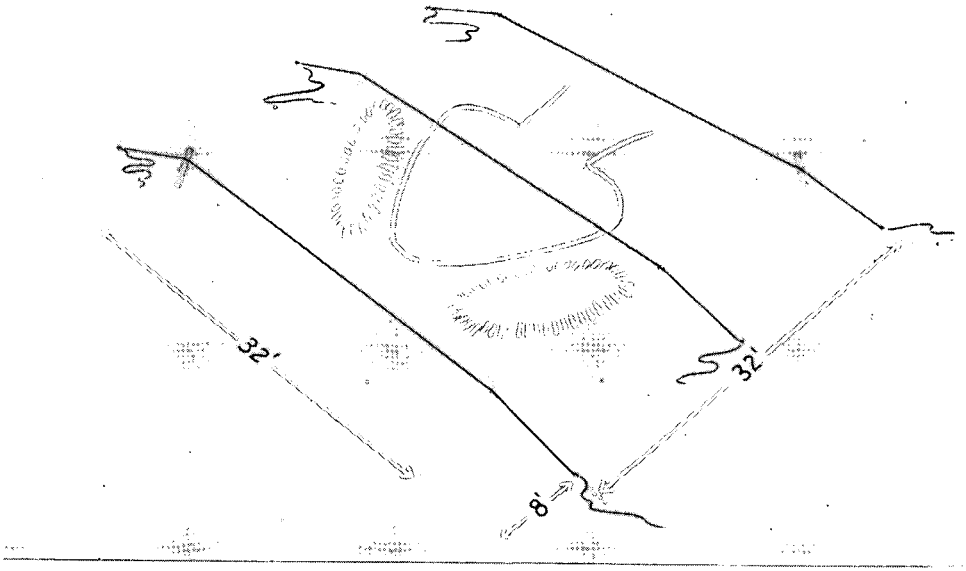
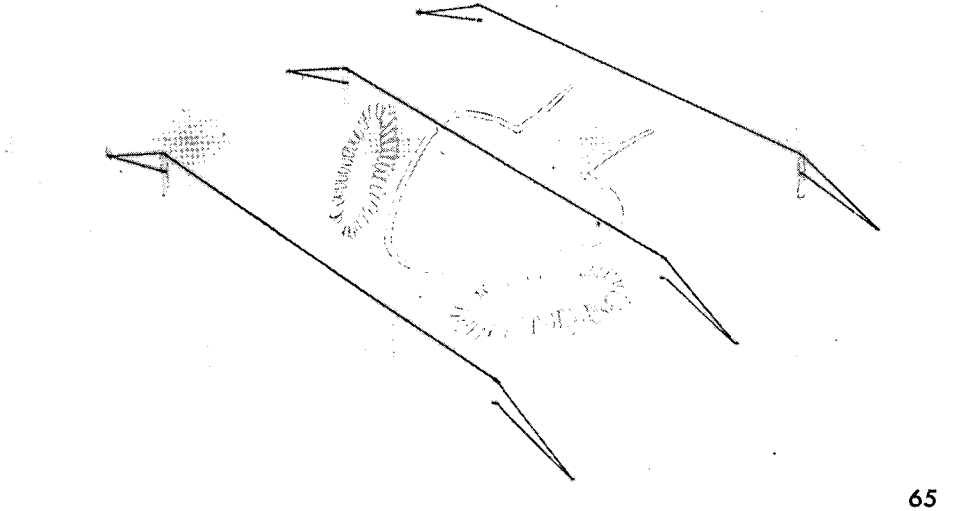


FIGURE 84 (a).

Second step. String three cross wires. The steps of stringing each wire are shown in figure 84. A side nail on the posts, about 12 inches from the top, supports the wire until it is pulled as tight as it is possible to do so by hand. The wire is then lifted to the post tops and set between two nails projecting about ½ inch. Posts are then pushed to a vertical position, and extra wire from stakes is attached to each post at the side nail [fig. 84 (b)]. The wires now should be very taut.

FIGURE 84 (b).



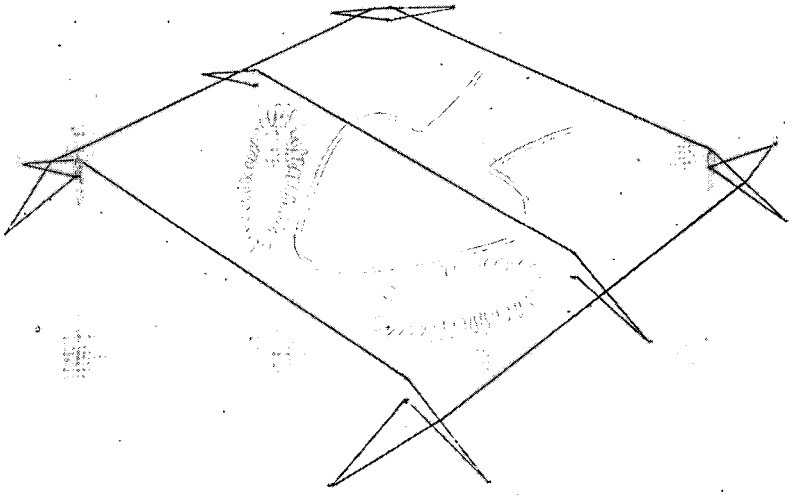
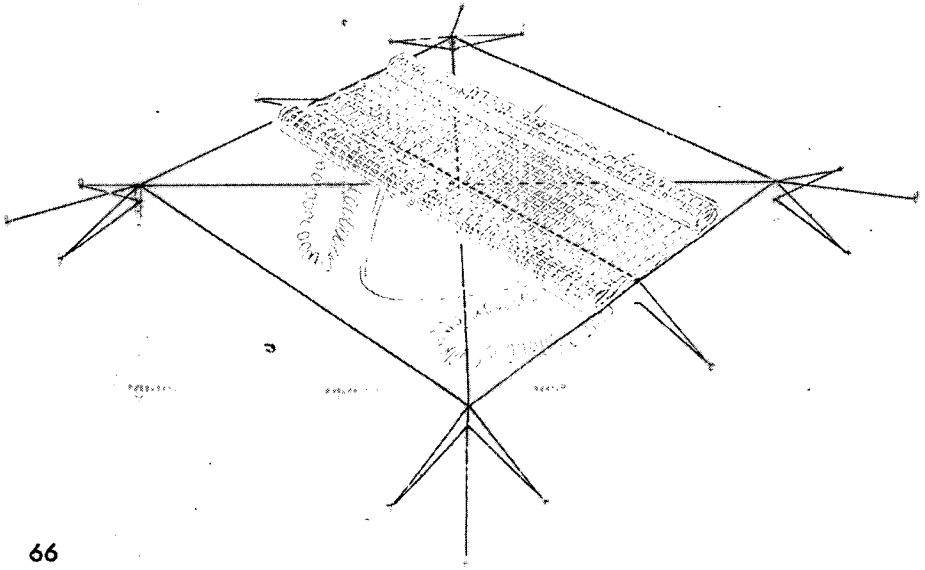


FIGURE 84 (c).

Third step. String the two side wires [fig. 84 (c)]. Fasten end to corner post 12 inches from top, run to and around stake two or three times, then back over the side guys to the opposite stake and corner post. Raise wire to top of posts, and if any slack remains rack the guy wires to remove it.

Fourth step. String diagonal wires from corner post to and around anchor stakes two or three times, then back across the post top to the

FIGURE 84 (d).



diagonally opposite post and stake [fig. 84 (d)]. These wires are tightened by racking.

Fifth step. Raise folded garnished net up on top of frame and unroll to the sides [fig. 84 (d)]. As net is being unrolled, lace it to the outside wire of the frame with No. 16 wire. There will be a gap of 12 to 18 inches between the net and frame wire. The net must be pulled as taut as possible and kept that way.

Sixth step. Place natural foliage on the ground around the structure as necessary to break up its silhouette. One man should stand at a distance from the net and on the enemy's side to determine its effectiveness.

All spoil around and in the emplacement should be covered with natural materials, and all tracks should be brushed out regardless of how difficult they are to see at close range.

A net shrinks when wet and must always be tightened again when it dries out. At the beginning of wet weather or before dew falls, loosen lacings to allow for shrinking.

When there are seasonal changes in the color of the background, the color of the garnishing must be gradually changed to match.

STUDY AND PRACTICE

This book contains the *how* and *why* of individual and infantry weapon concealment. However, merely studying these pages is not enough. Effective concealment requires a great deal of practice. There will be no time for practice on the battlefield. Practice the techniques of concealment until they become as familiar as marksmanship.